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[OFFICIAL CIRCULAR.]

ANNUAL MEETING WESTERN GAS ASSOCIATION.

SECRETARY'S OFFICE WESTERN GAS ASSOCIATION,
QUINCY, ILLS., Feb. 16, 1885.

The Eighth Annual Meeting of the Western Gas Association will be held at Chicago, Ills., on the 13th, 14th and 15th days of May. The matter of a selection of a hotel, etc., is already receiving the attention of the able local Committee of Arrangements, Messrs. Edwin Lee Brown, Peter T. Burtis, and Henry Pratt, and timely notice of their action will be furnished in these columns.

Although nearly three months must elapse before the date of our meeting, I am prompted by several motives in issuing this circular at the present time. In the first place, I wish to inform you that the same zeal and activity in the interests of our Association which have characterized its preparations heretofore are being manifested by our members generally, even at this early day. Flattering as has been our growth in the past, the coming reunion in the great metropolis of the Northwest promises to witness a larger attendance, and a correspondingly larger increase of membership than any of its predecessors. Our Association is now on such a substantial and enduring footing that anything like united action on the part of its members will be a sure forerunner of success; but it is not necessary to tell you that no effort must be relaxed, and no stone left unturned, if we would accomplish all that is to be desired. In this connection I invite, even more urgently than ever before, the zealous co-operation of every member of our fraternity. It has always seemed to me, and I am more forcibly impressed with the reflection now than at any time in the past, that too many of the preliminary details and arrangement of a programme are entrusted to the discretion of the Secretary. Now, while such an expression of your confidence may in itself be pleasing to that official, and though the thought may be gratifying to your Secretary that the many members of our organization are willing to empower him to take such steps as he may deem most fitting for bringing to a successful issue the grand finale, year by year; yet I would respectfully importune you to render me all the assistance possible, not that I have any wish or intention to slight the work in hand, but because I know that with your efficient aid the next meeting will prove more interesting and profitable than any others that have heretofore been held.

Should you ask in what way you can assist me, I would say let each and every one endeavor to present something of interest to the Association at its next meeting. Upon looking over the imposing array of names which constitute our membership, I cannot but be impressed with the belief that there is not one of the number who is incapable of presenting a paper—a bit of information, experience, or suggestion, which would be well worth the attention of his auditors. There are none so old, none so young, none so inexperienced or lacking in ability, but who can contribute, if they will, to the value and importance of our coming meeting. All that I can do in this matter is to ask (and you can rest assured that I shall not be backward in my solicitations), but it remains with yourselves to give.

This, my annual appeal for the preparation of those literary contributions which form such an essential, not to say vital, factor of interest at our gatherings, will meet, I hope and believe, with the same generous encouragement that has seconded my requests in the past. The presentation of papers at our St. Louis meeting was as liberal as their contents were valuable; and I desire to return to their authors my individual thanks for their warmly ap-

preciated efforts in the interest of our Association. They have already received their well-deserved and enduring reward in the vote of thanks tendered to them by the united voice of their fellow members, and by the perpetuation of their interesting contributions in the widely disseminated columns of the GAS LIGHT JOURNAL. At the risk of being deemed too presumptuously persistent, I call on them again to favor us in some shape with their past year's experience. I earnestly urge those (and their name is legion) who have not yet contributed essays on any of the almost numberless topics pertaining to our profession, to devote at least a part of their time during the ensuing ten weeks towards an effort to add to the interest of our meeting. Some labor will be required, and perhaps a certain amount of self-sacrifice may be involved; but you will receive your reward in the commendation of your brother members, and in the enjoyment of the satisfaction of having assisted in no slight degree to the beneficial results of our annual reunion.

It would give me great pleasure to have any member make suggestions, which might profitably be carried out, that would materially add to the pleasure or entertainment of those in attendance. There are doubtless many little matters, but nevertheless important in their way, which, if suggested and adopted, would prove marked attractions to our ordinary routine of business. At any rate, I am prepared to give a respectful hearing to any suggestion that may be offered, and if its acceptance should be found practicable the recommendation shall meet with favorable consideration. There may be members who would like to have a paper presented on some particular subject which would be of special interest to them, and perhaps to many others. If there are any such, and they will take the trouble to inform me of their wishes, I shall gladly endeavor to find a competent author to present the information of which they may feel in need. I invite correspondence with members "all along the line," and every letter of suggestion or inquiry will meet with deserved attention and a prompt response.

Members will confer a favor by notifying me at as early a date as is possible of the titles of their papers. Those desirous of joining our Association can procure blank forms of application by addressing the undersigned.

A. W. LITTLETON, Secretary.

P. S.—Since writing the above I have received the formal report of the committee on the selection of a hotel for our Chicago meeting. Due notice of their action, which I feel confident will be heartily approved, will be given in the next issue of this JOURNAL.

ANNUAL MEETING OF THE NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

The members of the pioneer American association of gas managers assembled in yearly conclave, for the Fifteenth Annual meeting, on the 18th and 19th days of February last, their favorite trysting place, the famous hostelry known as Young's Hotel, having been once more selected as affording appropriate shelter and suitable provender for themselves and guests. It goes without saying that no mistake was made in such selection, for previous experience of the identical spot had amply tested and completely demonstrated the thoroughness of all the appointments at "Young's Haven."

Having thus descanted upon the attractions of the hostelry, and for fear that we may be voted as paying too large a mead of notice towards the appointments for, and satisfaction of, the mere enjoyment of "creature comfort," the explanation is advanced that the weather was, as our specimen Anglomaniac would likely express it, just "beastly nawsty." A mention of the weather conditions prevailing all through the continuance of the Boston meeting of 1885 leads to the remark that it is hoped those of our Eastern countrymen who have been bewailing the fact that our latter winter seasons have been sadly lacking in the "snap" and "intensity" of their predecessors—degenerating, in fact, from their former frosty royalty—are now satisfied that the Frost King has not entirely deserted these dominions. Snow, close to zero, gloomy rawness, etc., made outdoor exercise anything but pleasant or inviting during the Fifteenth Annual Meeting of the New England Association of Gas Engineers. Perhaps it was better it should be so, seeing that external attractions were less likely to distract attention from the business proper of the sessions.

A pretty general understanding had been arrived at, toward the close of '84, that the principal topic (and one of grave importance to the brotherhood of the New England Association) to claim the attention of the members would be a consideration of the rascally action taken by the Board of Aldermen of the city of Boston with reference to the opposition gas schemes now fairly set afloat within the limits of the "Hub." With this tacit understanding, it was quite well known that the annual assemblage would not be disposed to enter largely into the discussion of technical matters connected with the practical operations of the gas maker's craft; and this determination was sensible and appropriate, when it is remembered that should the Bay State marauders see fit, with the prestige of their Boston victory (if the present triumph of Messrs. Addicks & Co. over every true and honest business principal may be denominated as such) fresh upon them, to extend their nefarious mode of operations to other cities of the Commonwealth of Massachusetts, it might readily be foreseen that nothing existed to prevent the self-same worthies from casting their net over the other New England States in their noisome efforts to "make a haul." We do not wish it to be inferred that the late session was devoid of value in a technical way. Although but two papers were presented, it can be truthfully asserted that these were of an order calculated to throw light on two subjects which have perplexed, and are now perplexing, the minds of many an engineer and superintendent.

Looking at the technical value of the meeting in another light than that of the presentation of set papers on special subjects, we are especially pleased to note the successful working of the plan which emanated with the resolution adopted at the '84 meeting from a suggestion made by the retiring President, Mr. A. B. Slater. Mr. Slater proposed that the Association appoint what might be termed a Board of Referees, to whom any of the members could, during the interim of the annual meetings, apply for advice and counsel upon any matters that the routine working of their plants should find them unable to cope with. While this proposition did not secure the assent of a majority of those in attendance, Mr. John P. Harbison (who was an active supporter of the plan) came to the rescue by suggesting that it would be well, as long as the Board of Referees were not to be given official existence, to at least order that a "question box" be provided, into which those anxious to have certain troublesome points answered might place their queries; then, when the regular order of business had terminated, the questions were to be read to the Association and the members invited to give their experience on the matters propounded. Mr. Harbison's motion having been carried, its wisdom was amply illustrated at the '85 session, for one of the most noteworthy features of the recent proceedings was the discussion so brought about.

The attendance at Young's on the days of meeting was very large, and goodly addition was made to the list of active members. A marked feature, also, was the number of invited guests present, these latter including Mr. T. G. Lansden, President of the Western Gas Association; Mr. A. C. Wood, of the Central New York Association; and Messrs. Page, Down, Floyd, and Isbell, of New York city, Stanley, of Brooklyn, Davis, of Boston, and many others. Right here it would not be out of place to say that Mr. Armington did the Association a good service when he insisted upon a carrying out of the rule requiring that no one should be admitted into the apartments allotted to the purposes of the Society during the continuance of the business sessions. No gentleman could object to the fairness of that arrangement; indeed, no gentleman would attempt to gain such admittance without first having received an express intimation that he was welcomed as a guest.

President Greenough's address speaks for itself—it will be found on pages 117 and 118. He of course referred to the "opposition" plans of the Bay State and kindred concerns, and spoke of the bill for a State Gas Commission now before the Massachusetts Legislature. He also made mention of the carbonic oxide matter in its relation to the public health, and noted that the State Board of Health were engaged in an exhaustive analysis of that subject. The preliminary report of that body has since been handed to the Massachusetts lawmakers. We have received a copy of it, unfortunately too late for publication with this number; but we may state that its findings are of the most positive sort as against the public policy of allowing water gas to be distributed as an illuminating agent.

The concluding sentence of the report reads as follows: "In conclusion, we may say that our opinion, based upon experiments, is decidedly averse to the general distribution of the so-called water gas, containing, as it does, so large a proportion of carbonic oxide." Profs. Sedgwick and Nichols, the testifying members of the Board of Health of Massachusetts, having no interest in the furtherance of any sort or kind of water gas schemes, have given their opinion in this case—not as the paid "experts" of any particular sort of manipulators, but as the chosen guardians and conservators of the health and lives of the people who hold them responsible to the duties of their public trust. Of a verity, then, now do the gas makers of Massachusetts know where to take their stand. This report will be dealt with at length in our next issue.

The Association re-elected Mr. M. S. Greenough to the position of President; Messrs. J. P. Harbison and A. M. Norton being also chosen to succeed themselves to the office of Vice-Presidents. Mr. Geo. B. Neal, who has held the office of Secretary and Treasurer ever since the organization of the Association, saw fit to declare that he thought he had served the Association for such a length of time as to earn a favor at its hands; and the favor sought for was that the Society would allow him to decline a re-election. While many were inclined to contest this request, it was eventually conceded that the worthy gentleman should have his way. Mr. Stiness, on behalf of the members, paid the retiring Secretary a well-merited expression of approbation at his past course, and regretted the determination which compelled them to accept his declination for a re-election. Mr. Neal responded neatly,

and had the further satisfaction of witnessing the induction to the Secretary's desk and Treasurer's duties of a gentleman well qualified to take up the tasks at the point where his predecessor left them off—Mr. Charles H. Nettleton, of Birmingham, Conn. The papers presented were the following: "The Influence of Steam in the Ashpan," by Mr. C. F. Prichard, of Lynn, Mass.; "An Experience with Naphthalene Deposits," by Edward C. Jones, of South Boston, Mass.

The Association selected Providence, R. I., as the place for holding the next annual meeting. At 2 P.M. on second day the banquet was enjoyed by the members and their guests, and a pleasantly, hospitable occasion and ceremony was enjoyed to the fullest measure. Owing to the circumstances mentioned by Mr. Greenough in his address, joined to the exceedingly inclement weather experienced, no formal visit to the new plant of the Boston Gas Company was made, although quite a number of those who remained over for the following day (Friday, 20th) journeyed down to Commercial Point, and there made a leisurely inspection of about the finest specimen of a gas plant at present completed in this country.

A COLORADO "BILL."

The infant State of Colorado has often furnished food for thought, and has done so in many curious ways. To commence with, her name, we believe, is derived from the Spanish style of expressing a thing that is red—hence probably the reason why her legislators are desirous of making an attempt at "painting" the gas companies with a stiff coating of legislation like unto the sample given below. Colorado is also noted as having blessed the American agriculturist with that curiously striped insect known to fame as the potato-bug; then, last and least, not long since one of her then Senators astonished and bewildered the dudes of the country by the simple means of allowing the "society reporters" to make complete examination and exhaustive explanation of the "wondrous beauty, marvelous construction, and exceeding great cost" of his *robes de nuit*. With all these reasons why "Colorado should be rejoiced at her proud position," a certain honorable member of her present House of Representatives, rejoicing in the name of Stuart, thinks that he can still further advance the "fair fame and reputation of his native State" by proposing to enact the following, which he terms, "A 'Bill' for an act establishing reasonable maximum rates to be charged by gas companies supplying cities and towns, and the inhabitants thereof, with gas, and providing penalties for the violation of its provisions." Had he commenced his precious "bill" with the understanding and avowed determination that the enactment was intended to "shut up the plants of existing gas companies in the State of Colorado, and to prevent the future formation of others," he would have been quite near the mark. Candor, however, compels us to say that Mr. Stuart may possibly have his own peculiar notions as to what construction one has a right to place upon the expression, "reasonable maximum rates," since even as though a former brother legislator did see fit to estimate the extent of his senatorial renown by the quality and cost of his night-shirts. The balance of the "bill" is as follows:

"*Be it enacted by the General Assembly of the State of Colorado:*

"SECTION I. No person, company or corporation supplying the inhabitants of cities or towns in this State with gas for illuminating or other purposes, shall charge, demand, or receive therefor a price to exceed one dollar per thousand feet; *provided, however*, that an additional charge of twenty-five cents per thousand feet may be added thereto where the amount is not paid within five days after statement is rendered.

"No charge shall be allowed or made for meters or use of pipes, or other or different charges than is herein provided for. Any person, company or corporation violating the provisions of this act shall be guilty of extortion, and, upon conviction, shall, for each offense, be fined in a sum not less than $300, nor more than $1,000.

"SECTION II. Any company, corporation or individual supplying gas, as provided in the last section, that shall refuse to supply the same on the conditions and at the prices stated in the last section shall be guilty of an attempt to practice extortion, and, upon conviction, shall be punished as provided in the last section; and the District Court, upon proof of such facts, may place the affairs and business of such gas company in the hands of a receiver.

"SECTION III. No person, company or corporation shall be permitted to set up any chartered or contract privilege to charge for the services rendered by them more than their reasonable value, or claim, under any charter or contract, that they have any right to charge unreasonable rates or make unreasonable claims.

"The rates fixed in this act are reasonable.

"SECTION IV. Nothing in this act is to be so construed as to violate the terms of any existing contract where the price of gas is distinctly fixed by such contract.

"SECTION V. All acts and parts of acts inconsistent with this act are hereby repealed."

The "far west" has usually been credited with the reputation of being the proper sphere wherein the talents and energies of our eastern youth might find a chance for quick development and speedy expansion; but Mr. Stuart (provided he can have his way) evidently intends that the gas supply of Colorado shall not be included in the list of avocations open to the enterprising eastern immigrant. Not only so; but, in effect, Mr. Stuart declares that Colorado can do without gas, unless the benevolently disposed capitalists of that region, blessed with senators possessed of wondrous nightrobes, are inclined to manufacture illuminating gas for the mere charity of the thing. At first blush we were disposed to think Mr. Stuart might possibly have secured an exclusive monopoly of all the Colorado right and title to every known electrical lighting patent (with a first mortgage upon those still buried within the brains of future inventors) and appliance; but the gentleman to whom we are indebted for a copy of the "bill" disposes of that theory, since he writes: "The uninitiated might suppose that next in order would be a bill for an act to establish reasonable rates to be charged for votes of members of the Legislature. This would, however, be a mistake; as it is generally supposed that whatever sum can be gotten is reasonable, and, further, that the maximum has not yet been discovered."

This statement presents a new (and yet an old) solution of the reasons *in ambiguo* within the Stuart "bill."

ANNUAL MEETING OF THE OHIO GAS ASSOCIATION.

The enterprising Ohio gas men who, in August last, gathered together at Columbus for the purpose of discussing the propriety and utility of the formation of a State Association of Gas Managers, were not apt to be misled in their conclusions. The temper of that conference plainly evidenced that the time had arrived when such an organization could be made a fruitful means for advancing the best interests of the Ohio fraternity. When the matter was first brought to our attention, and the names of those connected with the movement were made known, it required but little cogitation to form the opinion that success must inevitably attend the future operations of the proposed Society's acknowledged aims and ends. The history* of the "organization meeting," held at Columbus, Ohio, Sept. 17, 1884, when the Ohio Gas Association became a permanent feature, convinced even the most skeptical that the "infant" Society was bound to make its mark on the history of the craft. It is an undoubted trait of the "Westerner" that, whatever be the enterprise he engages in, he bends his energies and devotes his time to the accomplishment of its purposes, and the First Annual Meeting of the new Association gave every testimony that the Ohio gas man's heart was in his work.

We had previous occasion to express our regret that the date selected conflicted with the time appointed for the New England meeting, and since receiving some account of what transpired at Cincinnati we regret the "conflict" all the more. Not being gifted with ubiquity we journeyed eastward, as was our rightful duty. Mr. Bate's promise that this matter should be corrected has been adhered to, and the Ohio Association will hereafter hold their annual meetings on the third Wednesday in March.

The attendance at the Burnett House on the 18th and 19th of February was extremely large, fully 95 per cent. of the members being on hand, and the membership list was augmented by 20 per cent. It will be noted that Secretary Bate's "official notice" named only one day for keeping up the sittings; but the press of business was so great that before adjournment was reached two days' time had been consumed, an extra evening session being included. Gen. Andrew Hickenlooper presided, and when it is said that the General is one of the best parliamentarians in the Buckeye State enough is told to make it known that he controlled the body with efficiency and skill. His annual address was an excellent one, and in it he dealt largely with the history of the company whose policy he has so long and ably dictated. No less than eleven papers were contributed and read, and it is little wonder that Secretary Bate and the Executive Committee have sufficient reason for congratulating themselves upon the publication of that Tiffin circular† No. II. That circular contained a list of fourteen subjects, upon some one of which assignments were made to certain members who were supposed to prepare short papers in accordance with request of Executive Committee. Not much shirking was indulged in, and the only topics not ventilated in this way were those included under the 2d, 7th, 11th, 12th, and 14th headings. Duplicate papers were contributed on Nos. 1 and 8.

On the afternoon of second day the members, in a body, visited the new and elegant plant of the Cincinnati Gas Light Company; and President Hickenlooper had the genuine pleasure of overhearing a buzzing sound most pleasantly convincing him of what description was the impression made upon the sightseers. Ascending to the hall in the upper portion of the building, directly over superintendents' office and residence (Brother Fullager's quarters), a splendid banquet had been provided, through the hospitality of the Cincinnati Gas Light Company, for the enjoyment of the Society and its guests. How the company's generosity was appreciated needs no mention here. The Society elected the following Board of officers for ensuing year: President, Gen. Andrew Hickenlooper; Vice-President, H. J. Reinmund; Treasurer, P. W. Huntington; Secretary, Irvin Butterworth. The retiring Secretary, Mr. Jos. Bate, received a hearty vote of thanks (honestly merited, too,) for his untiring energies on behalf of the Association. A fully detailed report of the proceedings will appear in future issues of the JOURNAL. Before closing this all too brief editorial mention, we wish to extend our thanks to Gen. Hickenlooper and Mr. Emerson McMillin for courtesies received in connection with the Ohio meeting.

* See JOURNAL, Oct. 16, 1884, pp. 203-5.

† See JOURNAL, Feb. 2, 1885, p. 61.

[Official Report.]

Fifteenth Annual Meeting of the New England Association of Gas Engineers.

Held at Young's Hotel, Boston, Mass., Feb. 18 and 19, 1885.

First Day—Morning Session—Feb. 18.

The Fifteenth Annual Meeting of the New England Association of Gas Engineers was held at Young's Hotel, Boston, Mass., on the 18th and 19th days of February last. The Association was called to order at 11 A.M., on date of February 18th, with the President, Mr. M. S. Greenough, of Boston, Mass., in the Chair. A complete report of proceedings of the Fourteenth Annual Convention having been published in the American Gas Light Journal, a reading of the minutes of that meeting was dispensed with.

Roll Call.

Calling of the roll disclosed the presence of the following named members:

Honorary Member.

Joseph R. Thomas, New York City.

Active Members.

William Yorke, Portland, Maine.	G. L. Manchester, E. Hampton Mass.
L. P. Gerould, Manchester, N. H.	George B. Neal, Boston, Mass.
C. L. Gerould, Manchester, N. H.	C. F. Prichard, Lynn, Mass.
John M. Hill, Concord, N. H.	Edward G. Pratt, N. Attleboro, Mass.
A. M. Norton, Nashua, N. H.	A. D. Perry, Quincy, Mass.
John Andrew, Chelsea, Mass.	J. H. Rollins, Worcester, Mass.
Horace A. Allyn, Cambridge, Mass.	Chas. F. Spaulding, Brookline, Mass.
David Brayton, Brockton, Mass.	W. K. Stratton, Haverhill, Mass.
David Boynton, Chicopee, Mass.	J. Q. A. Spear, Boston, Mass.
F. C. Blood, Ware, Mass.	W. H. Snow, Holyoke, Mass.
George D. Cabot, Lawrence, Mass.	Chas. S. Spaulding, Brookline, Mass.
Oliver E. Cushing, Lowell, Mass.	Aaron Thompson, Woburn, Mass.
David W. Crafts, Northampton, Mass.	William Tarbell, Waltham, Mass.
John Cabot, Lawrence, Mass.	Dudley D. Tilton, Newburyport, Mass.
Patrick Coyle, Charlestown, Mass.	J. R. Todd, Natick, Mass.
William B. Durfee, Fall River, Mass.	Robert B. Taber, New Bedford, Mass.
Wm. B. Durfee, Jr., Fall River Mass.	A. W. Tarbell, Waltham, Mass.
F. R. Davis, Athol, Mass.	Gideon Wood, New Bedford, Mass.
M. S. Greenough, Boston, Mass.	L. W. Wells, Roxbury, Mass.
Estes Howe, Cambridge, Mass.	*Jas. H. Armington, Providence, R. I.
J. L. Hallett, Springfield, Mass.	Samuel G. Stiness, Pawtucket, R. I.
Edward Jones, Boston, Mass.	William A. Stedman, Newport, R. I.
Milton Jewett, Clinton, Mass.	A. B. Slater, Providence, R. I.
Edward C. Jones, Boston, Mass.	Ogden Gilmor, Norwich, Conn.
H. B. Leach, Taunton, Mass.	John P. Harbison, Hartford, Conn.
Charles D. Lamson, Boston, Mass.	Everett C. Learned, New Britain, Ct.
W. A. Learned, Newton, Mass.	Chas. H. Nettleton, Birmingham, Ct.
David Moore, Salem, Mass.	F. C. Sherman, New Haven, Conn.
A. H. Parker, Bangor, Maine.	H. A. Atwood, Plymouth, Mass.
John Burnham, Boston, Mass.	J. A. Coffin, Gloucester, Mass.
Z. M. Jenks, Woonsocket, R. I.	

New Members.

The Secretary—The following-named gentlemen having made application in due form to be admitted as active members of the Association, their applications were presented to the notice of the Board of Directors, acting as an Executive Committee. The aspirants for membership include Messrs. C. J. R. Humphreys, Lawrence, Mass.; W. A. Wood, Boston, Mass.; A. H. Norton, Nashua, N. H.; A. T. Cooper, Exeter, N. H.; and A. M. Copp, Boston, Mass. They all are possessed of the requisite qualifications for admission to this Association, and in consequence thereof the Executive Committee concur in unanimously recommending the names for affirmative action.

Mr. Stedman—I move that the usual course be taken in regard to the election to active membership of the gentlemen named.

The President—It is moved that the Secretary be authorized to cast the ballot of the Association in favor of electing the applicants for membership reported upon by the Executive Committee.

The motion was agreed to. The Secretary carried out the instructions of the President, and made a verbal report to the Chair, in which it was stated that the applicants for membership had been unanimously elected.

The President—The unanimous ballot of the Association having been cast for the admission to membership of the gentlemen already named, I declare that they have become, and are now, entitled to all the rights and privileges of this body. The Association is very glad to welcome them.

Mr. Harbison—Before the President's Address is presented, permit me to say that there are some gentlemen who are connected with gas interests, some of them being officers and members of associations other than the New England, who are in this city. Now it appears to me that it would be well to extend to these brethren our hospitalities and courtesies while they are here, and in accordance with that idea I move that a committee be appointed to invite these visitors to attend our sessions, so that they may become witnesses of our proceedings.

Mr. Stiness—I second that motion.

The President—It has been moved and seconded that the gentlemen visiting this city, who are officers or members of kindred associations, be invited to attend the sessions of this Association; also that a committee be appointed to invite such visitors to be present.

Mr. Armington—I move, as an amendment, that the names of the gentlemen who are to be invited be placed before the Association previous to their being informed of such action.

Mr. Harbison here explained that he had special reference to Mr. A. C. Wood, of Syracuse, N. Y., and Mr. T. G. Lansden, of St. Louis, Mo. The President suggested that Mr. Harbison's resolution should specify the gentlemen last named by him. Mr. Nettleton intimated that the name of Mr. G. S. Page, of New York, should be included.

The President then spoke as follows: This leads to a matter of interest to this Association that may as well be disposed of now as at any other time. Various things have been said to me (by members) with regard to the invitations which have at times been extended by this Association to gentlemen who are in no way connected with the profession, either as engineers or in any one of the cognate or allied branches of our common industry. I think that nine men out of ten who are properly connected with our profession are always welcomed by every member of the Association; but there are some gentlemen who have been present at various meetings of this Society, with whom some of our members say they do not wish to be associated at these annual gatherings; and now, in short, it is proposed to stop this objectionable attendance. I think you will agree with me in this matter. There is only one way to effect this purpose. The following practice was suggested to me, and I believe it to be a proper one: It is proposed that if any member desires to invite a friend (one in any proper manner identified with the profession) to attend a session of this Association, he should submit the name of that friend to the considertion of the Executive Committee, to the end that that Committee may report such name to the Association; and then, should no objection be made, the gentleman so reported upon may be invited to be present. If any member wishes to object to any outsider's attendance here, I think the objector has the right, and should be granted an opportunity, to speak his mind. I believe we may just as well settle the question now. We certainly do not want to make any inhospitable movement at the present time; but it seems to me, between now and the time set for the afternoon session, members wishing to invite friends to be present at this meeting should hand the names of such gentlemen to the Secretary, to the end that they may be laid before the Executive Committee and be passed upon by that Committee before they are invited to attend our sessions. That appears to me to offer a plan by which the matter may be arranged. I shall be glad to hear from Messrs. Armington, Nettleton, and Harbison if this suggestion meets their views. The remarks I have made express the sentiments of some of the gentlemen with whom I have conversed on this topic. I would like to hear from others.

Mr. Harbison—As a member of the Executive Committee I agree with what has been said by the Chair. I think the course outlined by the President is the proper one to pursue.

The plan proposed by President Greenough having proved entirely acceptable, those members who wished to invite a friend or friends to witness the proceedings handed in to the Secretary the names of those whom they desired to introduce. When the names had been formally forwarded, President Greenough announced the following list as embracing the gentlemen whom various members proposed to invite to the sessions:

W. H. Down, New York city.	F. J. Davis, Boston Mass.
H. H. Fish, Utica, N. Y.	F. W. Floyd, New York city.
C. C. Fry, Lynn, Mass.	C. W. Isbell, New York city.
G. F. Kreischer, New York city.	T. G. Lansden, St. Louis, Mo.
C. H. Newhall, Lynn, Mass.	G. S. Page, New York city.
James Porter, Greenfield, Mass.	I. N. Stanley, Brooklyn, N. Y.
J. M. Tyler, Cambridge, Mass.	A. C. Wood, Syracuse, N. Y.

After the reading was concluded the President inquired if any objections were to be offered to any name on the list.

Mr. Armington—I do not wish to debar any one of those gentlemen from coming in here at the present time; but I will say that I believe our present action is a most business-like proceeding. I think, Mr. President, that either you or I, or any other member, has an undoubted right to say who he would like to have enter his house, either in a social, business, or any other sort of way. This Association has been in existence for a number of years, and, on certain occasions, I think its privileges have suffered abuse.

* Now President of Brooklyn Gas Light Company, New York.

We know that some other Associations, and with which some of us are also connected, are very (and properly so) strict about these things. This Association was founded for the carrying out of specific purposes, and not for the purpose to which it has been put in times past by certain individuals. My idea in offering the amendment to Mr. Harbison's motion was simply to obviate a repetition of similar schemes. I further hope that the new course of procedure here instituted will be made an imperatively binding rule, so that hereafter no gentleman will think he can enter the door of our meeting-room unless he has been especially invited to do so (after his name has been presented to the Association), and it has been found that no objection exists to the extension of an invitation to him. I am free to say that at least one individual has attended these meetings who will unseat me if the future should continue to admit him here.

The President—The question now is upon the extension of a unanimous invitation to the gentlemen previously named to attend this meeting of the Association. Do I hear a single objection to any name on the list?

No objection having been offered, the Chairman announced that the Association would be very happy to receive the visitors.

The next business in order was the reception of the

President's Address.

President M. S. Greenough then delivered the following inaugural message:

Gentlemen of the New England Association:—To expect from me on this occasion a carefully written address would, I think, be almost as unreasonable as to require from the Commandant of the English forces in the Soudan an elegantly compiled disquisition on the "Art of War." You will, I know, bear with me if the press of urgent business has prevented me from giving to this matter the thought and time which it really demands, and now compels me to bring before you the questions on which I desire to speak in such a fashion as I have best been able, but not as I should like to present them.

The history of the gas business throughout New England during the past year, has, in one sense at least, been uneventful. No company's works (so far as I am aware of) has been the scene of any great disaster. No member of our Association (so far as heard from) has, within the past twelvemonth, discovered—for the thousandth time—that process of manufacture which was sure to revolutionize the present methods, and prove a fortune to all concerned. In this part of the country a steady increase in business, and cheapening of first cost, has enabled most of the companies to materially reduce the price to the consumer—a reduction which has been received with that gratitude and appreciation which might, perhaps, have been expected. It would have been impossible to secure stronger petitions than those which have been collected for a new gas company in Boston if the selling price of gas had been $2.50 instead of $1.50; and the stories of the enormous profits which we are making, at the latter price, seem to be as readily believed.

The year has been a notable one, however, to the Boston Gas Company in other respects. We have started a set of coal gas works which have differed much from the ordinary works hitherto in use. In building them it was our intention to construct a retort house which should largely be run by machinery. We have been in hope that we should be able to-morrow to invite the Association to visit Commercial Point and there see in operation apparatus which would break, elevate and distribute the coal in bins, in the center of the retort house, from which it would run, by gravity, into a hydraulic charging machine which should put it into the retorts. A Ross discharging machine then draws the coke, so that it falls into the cellar on cars, where it is quenched; the cars are then lifted upon a hydraulic elevator to an appropriate level, where they can either be emptied upon the coke pile, or discharged into other cars whose duty it is to supply the fuel with which the furnaces are to be charged.

I am sorry to say that that expectation cannot be realized. A large portion of the apparatus there being new in design, difficulties have arisen in its use which could not have been anticipated, nor consequently provided against, until they were developed or discovered through the working test of actual experience. The coal elevator and breaker are all right, but the distributor has several times broken at precisely the same place; and now that it has been reconstructed on a new plan, an accident has happened to the engine that runs it. Without the distributor we could not use either the coal bins or the charger, so that all we have to present to your notice at Dorchester is much like what can be seen elsewhere, except as to general plan of arrangement.

I am greatly pleased to be enabled to bring to your attention the satisfactory working of our generator furnaces. We charge them with wetted coke, and also distill a large quantity of steam from the ashpans. The furnaces are cool, but the retorts can be brought to any required heat. We charge each retort, every four hours, with 333 pounds of coal, and make about 9,500 cubic feet of gas to the mouthpiece in twenty-four hours. It takes about 50 bushels of coke a day to work this off. This approximates closely to 22 per cent., by volume, of the coke made; or it means about 15 lbs. of coke to work off 100 lbs. of coal. This, on the whole, is as good work as can be expected without more expensive recuperation than I think would be profitable to enter into; and, in fact, the value of regenerator furnaces in any shape or form must be largely affected and determined by the price of coke in the locality under consideration.

It may be of interest to submit to you an analysis of the gases from the furnace and in the outlet flue:

From Furnace.		Outlet.	
CO_2	7.29	CO_2	17.58
CO	31.48	O	3.56
H	9.98	H	
N	61.25	N	78.86

This shows the result of the use of steam in the furnace. In no other analysis which we have made have we ever found free hydrogen.

The outlet gases showed a slight excess of air at the time of the analysis; but this might have varied on other occasions when the coke in the furnace was at a slightly different height. At any rate, the results are satisfactory enough.

The really interesting questions, however, to us in Boston, Massachusetts, are not so much at present involved in the details of the thoroughly skilful management of a gas works; but they are instead—whether we are to continue to transact our business at all, and, if so, under what conditions?

The Association will probably remember that in October last, after the case of the Consumers Company had been apparently settled against its promoters, I offered an order, in my position as Alderman of the city, providing for a petition to the Legislature by the city of Boston asking for the appointment of a Gas Commission. I believed then, and have discovered no reason since to change my mind, that such a Commission would afford the most satisfactory solution of the present unpleasant condition and standing of affairs. In every community in which gas is sold there always exists a certain easily discoverable percentage of dissatisfied consumers. On this number the question of price has no effect. There is as much grumbling in Boston, with gas at $1.50, as there was in New York with the same commodity at $2.25. These discontents are not satisfied with any condition of affairs in a business so mysterious as those with which are conducted the operations of gas companies. Nothing can persuade them that the profits of gas companies are not enormous.

A number of years ago my father was sent for by the then Mayor of Boston and told that he had been informed that the profits of gas making were so enormous that the city, by acquiring possession of the gas works, could pay all its running expenses. The worthy mayor was somewhat surprised to learn that his informant was considerably in error, for the gross receipts of the company at that time were not over one-half million of dollars.

If any city in this country (as some municipalities have done) should see fit to purchase the rights and property of existent gas corporations, and would operate them with even a moderate degree of regard for the public good, there is no doubt that in many cases it might prove of public advantage. The most entire publicity would, of course, be given to the business; the public could, at all events, fix its own price, and the city could borrow money at lower rates than any private citizen would be content to risk his capital for. That suspicion of jobbery, however, which haunts the administration of so many public trusts in this country, makes the public unwilling to put into such hands as now hold the reins of power in many cities such a further opportunity for peculation. The management of the Philadelphia (Pa.) Gas Trust has been a standing warning against such a course.

The next best thing to a city's running its own gas works is to have proper supervision exercised over the existing companies; and, as I have said before, a measure looking in that direction is now under consideration by the Legislature of Massachusetts. It comes before them on the petition of the city of Boston, and the order for that purpose was offered by myself, as an Alderman, last year, after the question of competition had been apparently settled in our favor. It could not, of course, have been reasonably anticipated that two members of the Board of Aldermen would eat the words of their own report, and, without any explanation whatever, reverse their previous action. I have yet to hear of any explanation—save one—which could in any way account for such behavior.

As matters stand at present, the interest which the Boston companies have in a Commission is materially lessened. If we are to remain monopolies in our respective districts, we of course have duties corresponding to, and commensurate with, our privileges. The public is right in demanding that it shall be supplied with good gas as cheaply as the circumstances of each company will permit; and it has also the right to know that this is a fact. No company, it seems to me, which is doing a legitimate business, and not exacting an improper price for its gas, can object to such proposal—provided it is accompanied by a due degree of protection. If the protection against competition is withdrawn, there is, of course, no reason why our affairs should be inspected. If the gas business is to be thrown open to all comers, then such investigation of private affairs becomes an impertinence.

As I write at present I do not know what may be in store for us in Boston. If we are to have competition, I take no special interest in the passage of the bill; if we are to be left alone in the possession of our franchise, I hope it will pass, as I know of no other way in which the public and the company can both be so well served and protected. It may, however, be of interest to the members of this Association from the State of Massachusetts to know that the philanthropist who proposes to benefit Boston by competition does not intend to confine himself nor his operations to this locality. He has asked for a capital of five millions of dollars, and asserts that it is for use all over the State. In Boston he has not offered to furnish gas of any specified quality, nor at any stated price. He has simply offered the *benefits* of competition, and his order passed the Board of Aldermen; so that you, gentlemen, can readily see how little protection it may be to you to sell good gas at a low figure when such seductive advocates appear before your City Councils.

The proposal for a Commission is practically this, if amended as proposed by us—that no company which shows its figures, and accedes to the recommendations of the Commissioners, shall be troubled by competition; for the assent of the Commissioners must be given to enable the institution of a rival works, and that permission would not probably be obtained. I should be pleased to have this Association express itself in no uncertain way, and hope some action will be taken at this meeting on the subject.

The fact that any company differs from the position taken by the Boston companies last year, in regard to water gas, need in no way affect his own in this matter; for it is, of course, to the interest of any existing company to preserve its monopoly; and should water gas possess all the attributes that its advocates claim for it, it will be easy to persuade the Commission of its advantages.

This brings me to the question of water gas, and on it I should like to say but a few words. If an advocate of its use says that carbonic oxide is so good a thing in gas that you cannot have too much of it—that all this talk about poisoning is moonshine—then I admit that I am compelled to doubt either the intelligence or the good faith of such a person. If, on the other hand, he says, "I admit what you say about carbonic oxide being a blood poison; I admit that accidents occasionally will happen from its use which would not under similar circumstances have been caused by coal gas; but as an offset to that I can either give you as good light as you are now getting, at a large reduction in cost, or, for the same money, I can give you a light of much greater brightness; gas is made to burn, not to breathe; and a great improvement is rarely introduced into society without subjecting it to some additional risk"—to such a person I am entirely willing to talk; and I consider it a fair presentation of his side of the case. It reduces the question to the simple business basis of "how much risk ought to be taken if a better article can be given"—it having first been proved that there is any advantage in that direction. This last, again, becomes a question of locality, dependent upon the relative cost of the materials from which the two gases are made, and the value of the coal gas residuals—which varies greatly.

Other things being equal—*i. e.*, if the cost of each kind of gas is the same—then I do not consider that a single life should be risked; but if a saving of 15 or 20 cents a thousand can be made—then what is our duty?

As the law of Massachusetts stands at present, it is no more criminal to have 20 per cent. of carbonic oxide in your gas than it is to have 15 grains of ammonia per 100 cubic feet. If it is the poison that it has been claimed to be, then it ought to be more rigidly pronounced against; if not, then it ought to be struck out of the list of impurities. The matter is at present before the Legislature, and the State Board of Health has been requested to report upon it. Their report, which is promised, at least in part, for next week, will be looked for with interest, and the future position on which we all are to stand may be much affected. If in the judgment of the Legislature there should be no restriction on this quality of gas, we shall then be entirely freed from any responsibility in the matter, and can make water gas freely if it seems pecuniarily advisable; but in the present undecided condition of affairs I am loath to recommend any gas which is going to largely increase the percentage of what is known to be a most virulent poison when inhaled.

If the report of the State Board is made, as promised, next week, we shall soon know where to take our stand.

Mr. Stiness—I suppose there is no member of the Association who fails to fully appreciate the position our Chairman has occupied during the past few months. I move that we pass a vote of thanks to him for the paper which he has presented to us to-day; and as there are some recommendations embodied in the message which we will desire to discuss when there is proper opportunity, I also move that the paper be laid upon the table until we shall have leisure to take it up, and give a thorough consideration to the suggestions which he has made.

The President—You have heard the motion made by Mr. Stiness—that the message be laid upon the table, and that it be taken therefrom and discussed at a later hour.

The motion was agreed to.

[To be continued.]

Lecture on Coal Gas, by Prof. Thorpe.

Gas and Water reports that on the evening of Wednesday, February 4th, Prof. Thorpe, F.R.S., of Leeds, England, delivered the second of two popular lectures upon the manufacture of gas and its economical consumption, in the Lecture Hall of the Yorkshire College. Having pointed out that the character of the finished product depended, among other things, upon the nature of the coal used in the manufacture, upon the temperature employed, and upon the care spent in the process of purification, the lecturer went on to explain the chief characteristics of coal gas as it is delivered in the houses of consumers. He might take it that London and Manchester gas fairly represented the quality used in the larger towns of England. As shown upon the diagram which the learned professor referred to, coal gas was substantially a mixture of hydrogen, marsh gas, and carbonic oxide; but the substances to which the true illuminating power of the gas was due were classed under the generic term, olefiants. His audience, he said, would see that the hydrogen was fairly constant, varying from 46 to upwards of 50 per cent. of the volume of the gas. The amount of marsh gas was approximately the same in the three samples on the diagram; the amount of carbonic oxide varied between 5¼ and 7½ per cent., and the amount of olefiants varied from 3½ up to 7¼ per cent. The greatest variation, therefore, was in the class of bodies which were classed together as olefiants. In addition to all these there were varying amounts of nitrogen, carbonic acid, and more or less of sulphuretted hydrogen. Some of these ingredients contributed nothing at all to the illuminating power—indeed, those which were present relatively in the largest proportion, had nothing whatever to do with the light-giving power of gas, but they had a great deal to do with its heat-giving properties, and they served, in addition to that, the useful purpose of being a sort of medium in which the light-giving constituents were suspended and properly burned.

By experiment the speaker demonstrated the non-luminous properties of hydrogen gas, the more luminous power of marsh gas, and the beautiful blue flame of carbonic oxide. Then he took a quantity of olefiant gas which he showed burned with a bright but smoky flame. Under this title he also showed the flame given forth by acetylene—a compound which, he said, was present in every gas, and more especially in gases which had been formed at a high temperature. It burned with a smoky flame, was rather difficult to kindle, and it was highly poisonous to breathe. But in addition to these light-giving constituents there were benzene and certain other hydrocarbons which belonged to the same chemical family. By some authorities it was stated that the greater portion of the light giving power of many gases was due to the diffusion throughout them of the vapors of benzene. By a simple experiment the speaker showed his audience how this vapor, even in the most minute quantity, added to the luminosity of a hydrogen flame. In a bottle to which he had two tubes with burners, he, by means of sulphuric acid and zinc, liberated hydrogen. Through one of the tubes hydrogen alone was allowed to pass, and it burned with a non-luminous flame; but in the other tube the hydrogen had to pass through cotton saturated with benzene, and at this burner, when a light was applied, a highly luminous flame was produced. This experiment showed how hydrogen took up the benzene vapors and carried them to the point of combustion.

The lecturer afterwards drew attention to the deteriorating effect of carbonic acid upon the luminosity of the other constituents of coal gas, and said that a small proportion of it would destroy the illuminating power by many per cents., and for this reason gas manufacturers wanted to get rid of every trace of it. He next directed attention to the different temperatures which were necessary to bring about illumination. Some gases burned at a low and others at a relatively high temperature. There was, in fact, for every gas a specific temperature at which alone it would ignite. Some gases burned when brought into contact with the air, and others required to be heated before chemical combination could be initiated, and the amount of heat varied with each particular gas. He demonstrated this by various experiments, and particularly showed that it was difficult to ignite marsh gas by means of the electric lighter—the temperature of the spark not being sufficiently intense. Dwelling upon this point Professor Thorpe explained to his audience that, in days long anterior to the invention of the Davy lamp, miners excavated coal by means of the feeble rays emitted by bringing a revolving wheel in contact with flint. A series of sparks were thus produced which enabled the miner to pursue his work, and which were yet not so intense as to ignite any marsh gas in the neighborhood.

Putting the facts which he had explained together his audience would see that the different constituents of coal gas did not ignite with the same readiness, and that they did not burn at the same rate. When a light was presented to a gas flame what really occurred was that the hydrogen was ignited, and the high temperature of the burning hydrogen ignited the marsh gas, and so combustion was determined. As they might readily perceive the gases composing the flame could not be all burning at the same rate—some burned faster than the others. Speaking generally, it would be found that

the first to burn was the hydrogen, and then, at a certain stage, the marsh gas was ignited, and the result of the decomposition was watery vapor and carbonic acid. The olefiants suffered a number of changes. First they broke up into simpler hydrocarbons, with a separation of carbon, and it was this carbon which contributed most to this luminosity of the flame—the heavier hydrocarbons broke up into simpler hydrocarbons, and finally split up into carbonic acid. A great deal was yet to be discovered with reference to the luminosity of a flame.

Having pointed out that the main facts connected with it were discovered by Sir H. Davy, he went on to show that the light-giving property of a candle was due to the presence in it of solid carbon; that in the process of the distillation of the fatty matter the heavy hydrocarbons were resolved into simpler ones, and that the temperature caused these to radiate light. The idea that the light-giving power of the flame resided simply in solid matter had been controverted in recent times. Dr. Frankland had drawn special attention to facts which, he thought, were inconsistent with the notion that the light-giving power of all flames was solely due to the presence of solid matter. He (the speaker) had only to say that when hydrogen was burned a flame of very little luminiferous value was got; but if it were burned in a stream of highly compressed air a very bright light would be obtained. Now, in this gas there was no suspicion of solid matter, and the resulting product of the combustion was gas. This fact, he mentioned, was inconsistent with the general hypothesis that the light-giving character of the flame was due to the incandescence of solid matter. Dr. Frankland put forth the hypothesis that the light-giving character of the flame was really connected with the density of the gases which were undergoing combustion. Now, the ordinary proofs that there is solid matter in a candle or in a gas flame were that it could be got out of them. Every one knew that when a cold object was brought in contact with a flame there was a deposit of soot. Dr. Frankland, however, had shown that soot was not pure carbon, but that it contained a certain amount of hydrogen—as much, indeed, as was present in certain well-authenticated hydrocarbons. But it was pointed out that a gas flame was transparent. A newspaper could be read through it, and this fact seemed to be inconsistent with the idea that there was solid matter between the eye and the object looked at.

The facts adduced to controvert Dr. Frankland were that if soot was a hydrocarbon existing in the vapors contained in the flame, chemists ought to be able to reconvert it to vapor by heating it to a high temperature; yet no temperature which they had been able to command had been sufficient to vaporize soot. Dr. Frankland supposed that the soot called hydrocarbon was simply due to the reaction consequent upon the introduction of a cold body to the flame; but he (the speaker) had to say that if a hot body instead of a cold one were used a deposit of soot would still be obtained. Then, he argued, the transparency of an object was no test whatever. Looking at any object an impression was got on the retina, and if there was passed between the eye and the object a solid body, at sufficient velocity, the image on the retina would still subsist. But then, again, a candle flame, or any other luminiferous flame which owed its luminosity to the burning of hydrocarbons, threw a shadow if a stronger light, such as the sun, shone upon it; and it would be seen upon observation that the shadow was strongest from those parts of the flame which would give the greatest quantity of soot. This proved that solid matter was present. If it was altogether pure gas there would be nothing to stop the rays of the more powerful light, and consequently there would be no shadow.

At some length the speaker explained the method of calculating the relative value of gas light, and described the various photometers in use for making the tests; and thereafter he dwelt upon the nature of the sulphur impurities which were to be met with in ordinary coal gas. Sulphur existed as sulphuretted hydrogen and as the bisulphide of carbon, and possibly in a third form as a compound which was known to chemists under the name of phynl-sulphocyanide. There was reason to believe that the peculiar smell of coal gas was due to the dissemination of small quantities of this compound. He then explained to the audience the various tests that were made for sulphur compounds as well as for ammonia; and having given an analysis of Leeds gas supplied by Mr. Fairly, the speaker proceeded to remark upon the economical consumption of gas.

Upon this point he said that a gas manager might be at infinite pains to make good gas, and his efforts might be thrown away by ignorant and wasteful burning. His experience was that the cause of complaints as to the quality of gas leveled against gas managers was due rather to the consumer himself. Gas was usually very much better than it was represented to be by those who burned it. He showed from public statistics how much good gas was reduced in value by the use of bad burners, and how necessary it was, therefore, to obtain burners adjusted to the qualities of gas used in different parts of the kingdom. This question, he said, was important, not only on account of the inadequate return for our money in the shape of light, when bad burners were used, but also from a health point of view. The more perfect the combustion of gas in rightly adjusted burners, the better the light, the fewer the burners required, and the vitiation of the atmosphere would be proportionately reduced.

Through the kindness of Mr. Bray, the lecturer said he was able to show a variety of burners, from the original rat-tail to the most modern slit union and batswing. The construction of the various burners was explained by means of diagrams and sections, and their action was practically illustrated—a splendid effect being produced by lighting one of Bray's 2,000-candle power clusters. The lecturer then went on to say that it had been determined by photometric observations that for each particular burner there was a given pressure of gas, and manufacturers had aimed to regulate their burners to meet specific pressures. Consistent with giving a burner its proper quantity of gas, as low a pressure as possible should be used. This enabled the flame to acquire its proper shape. While he said this he mentioned that there was a good deal of uncertainty as to the conditions under which gas burned. Mr. Bray doubted whether low pressure had anything to do with obtaining the best results. No doubt, under certain circumstances, low pressure meant something; but there must be added to that the relative thickness of the flame, which Mr. Bray thought modified to some extent its light-giving properties. A great deal of information was wanted regarding the physical condition of gas as it issues through the narrow aperture at the point of ignition. Although the gas was at a low or a given pressure before it reached the narrow aperture, it did not follow that it had the same pressure when it emerged to the open air. The lecturer illustrated his point by describing the action of the Bunsen burner. In this burner, when the gas issued from the aperture to enter the upright tube, it expanded very considerably; and in virtue of the low pressure which prevailed, and the upward tendency of the gas, air was dragged in, and both agents were at work. A somewhat similar action prevailed in the ordinary case of gas burning; so that the gas at the point of ignition was not exactly in the degree of tension which existed further to the rear—the particles were relatively at greater distances one from the other. This was the condition which he believed existed, and it had not, apparently, been recognized by people who had discussed the various conditions of luminosity. Whatever might be the theory, suitably constructed modern burners did check the flow of gas. In Mr. Bray's burners, as might be seen from the reports made to the British Association, there was this checking action.

In his concluding observations Professor Thorpe made a brief reference to the use of gas as a fuel, and he showed one of Mr. Wilson's (of Leeds) newest forms of heating stoves in operation.

The lecture was listened to with much interest, and during its delivery Professor Thorpe was frequently applauded.

SPECIAL ENGLISH CORRESPONDENCE.

Communicated By Norton H. Humphrys.

Salisbury, Feb. 10, 1885.

The report and statement of accounts of the Gas Light and Coke Company for the half year ended, Dec. 31st, 1884, have just been issued to the shareholders in anticipation of the usual half-yearly meeting which is to be held on the 13th inst. This company supplies the principal portion of the city of London—that situated on the north side of the river Thames. The report on this occasion introduces a noticeable innovation, and one that will be generally welcomed as a great improvement. Formerly it consisted simply of a report from the directors, signed by the chairman; but now it comprises four sections, viz., the usual director's report, one from Mr. G. C. Trewby, the constructing and carbonizing engineer-in-chief, respecting his department, a return from the distribution department, by Mr. Robert Harris, distributing engineer, and a brief note as to the products department, by Mr. Thos. Wilton, superintendent of the products works. Having on former occasions observed that this company, in their reports, have scarcely given sufficient prominence to the technical and engineering talent which has mainly been instrumental in building up this colossal undertaking in its present highly prosperous and substantial condition, it is with pleasure that the writer refers to this innovation as one worthy of being followed by all similar undertakings of unusually large extent and importance. The directors' report states that the profit earned from all sources during the six months is £509,261, which will admit of the payment of a dividend at the rate of 12 per cent. per annum, an addition to the reserve fund of £13,606, and will leave a small balance in hand. A reduction of 2d. per 1,000 cubic feet in the price of gas consumed in the public lamps, viz., from 2s. 8d. to 2s. 6d. per 1,000 cubic feet (from 64 to 60 cents) is also announced, the rates to private consumers remaining as before. Perhaps it would be rather uncomplimentary to the local public authorities that this is "throwing a sop to Cerberus;" and the question of the claims of ordinary private consumers as compared with those of local authorities is too complicated to be entered upon here. Mr. Trewby remarks that since the date of his appointment in March last no additions of special importance have been made to the company's plant;

and that during the present winter ample power has been at all times available to meet any probable increase in the consumption of gas. The third paragraph of the report is worthy of special notice. It is as follows: "Particular attention has been given during the half year to allocate as much manufacture as possible to those stations where gas can be most economically produced; or, in other words, the more expensive manufacturing stations have been limited, as far as possible, in their production." Of the dozen or so different stations situated in various parts of the metropolis it is obvious that some must be more favorably situated than others for the economical production of gas, and that on account of several different causes. They may offer better transit facilities for the delivery of the coal to the front of the retort, or for the delivery of coke to the purchaser; or new apparatus on modern principles may have been erected of much greater productive capacity, as compared with the worn-out plant which it has replaced. But few undertakings attain such magnitude as to admit of the application of this principle, which must be regarded as the latest experiment in modern gas engineering.

Some economy is noticeable in the manufacturing charges, probably as the result of applying the above plan. Although 8,125 millions cubic feet have been produced, as compared with 8,001 millions produced during the six months ended Dec. 1883—a respectable increase of 124 millions—the costs of coal, salaries, wages and purification have each been slightly reduced; and an important diminution of over £45,000 has been made in the cost of repairs and maintenance. Mr. Harris has also effected some economy to the extent of four or five per cent. in his department. He reports that the total length of the company's mains is now 1,755 miles; 3,585 new services have been laid; but the net addition to the number of meters is only 1,293. Why there is not a larger increase in respect to meters is not very obvious, since each new service presumably requires a new meter. Perhaps the services also include those laid in place of previously existing but nearly worn out ones, as well as *bona fide* new and additional services. An important increase of no less than 24 per cent. has been effected in the number of gas stoves let on hire, which has now reached the respectable figure of 3,653. This, of course, does not include stoves which are the property of consumers. An increase of 5.2 per cent. in the number of gas engines is recorded, and this now stands at 949. Mr. Harris and his colleagues have evidently been busily employed during the half year.

The working results are satisfactory. The average yield of gas per ton of coal carbonized is about 10,230 cubic feet, equivalent to 4.56 cubic feet per pound of coal; and of the gas made more than 93 per cent. has been duly "brought to book," 1½ per cent having been used on works, and 5½ per cent. is unaccounted for. To this should be added that the returns of the examiners show that the gas supplied has been well above the standard both in respect to illuminating power and purity.

From the affairs of this enormous concern we will turn, by way of contrast, to those of one of the smallest. This company has a capital of £5,000, and supplies the needs of about 200 consumers in a district of 6,000 inhabitants, and may be taken as a fair example of the working of small gas works in this country. The receipts for gas during the past year are £1,161, and the amounts received for coke, tar, rents, etc., bring the total receipts up to £1,359. The expenditure, in which the item for coals figures as £440, and including £100 set aside for depreciation of works, amounts to £1,047, leaving a balance of £311 available as profit, or rather more than sufficient to pay a dividend of 6 per cent. In this case the proprietors, having an eye to the competition of cheap petroleum, have followed the wise policy of selling gas at a moderate price. Sometimes, in these small undertakings, the price is kept up sufficiently to admit of a larger dividend; but especially remembering that it is not worth while with so small a revenue to go to the expense of obtaining Parliamentary powers, and therefore that the concern is on the same footing as an ordinary tradesman in respect to competition, such a course is likely to produce troublesome results. Perhaps I should explain that the main object of applying for Parliamentary powers is to obtain immunity from competition in respect to a certain defined district—a privilege which Parliament is prepared to grant, subject to the undertaking of certain obligations in return. Passing on to notice the working results; 585 tons of coal were used, and yielded 5,725,000 cubic feet of gas, or 9,800 cubic feet per ton; and of this quantity 89 per cent. was sold, 5 per cent. used on the works (rather an extravagant consumption), and 6 per cent. unaccounted for.

A well-worn humorous anecdote, untrue, but amusing as most of these sayings are, relates that a Scotchman was offered a patent stove that would save one-half of his fuel, and that, after due consideration, he decided to purchase two stoves, so as to *save it all*. And really, judging from the way the introducers of "cheap gas" schemes are going on, the gas producer of the *save it all* description is not far off. The public has been promised gas at 6d., 4d., and even lower rates, per 1,000 cubic feet; but schemes of this mild description are left far in the rear by a recently-issued pamphlet describing the performances of a patent generator capable of producing 100,000 to 200,000 cubic feet of 16-candle power gas per ton of coal—but this is not all—per ton of the smallest and cheapest coal slack; and this gas, it is claimed, can be "profitably sold" at the rate of one penny per 1,000 cubic feet. This might as well have been put as "profitably given away," seeing that the modest penny would scarcely recoup the cost of taking the meter indices, making out the bills, and collecting. Since a ton of coal weighs a ton, and 100,000 cubic feet of gas weighs a ton and a half, it may be presumed that water or air is called in to supply the missing 10 or 11 cwt. It is well said that "truth (!) is stranger than fiction." Many gas engineers, however, will be glad to hear that a demand has arisen for the "smallest and cheapest coal slack," as there will then be not so much probability of a moderate proportion finding its way, in some unaccountable manner, into cargoes sold as screened gas coal.

For an example of the modern Shylock, determined to have his "pound of flesh," commend me to the corporation of the ancient town of Newcastle-on-Tyne; the atmosphere of which is usually so laden with odors of one kind and another from the surrounding chemical factories as to render a few thousandths of a grain of sulphur per cubic foot, more or less, of no possible practical consequence. The Newcastle and Gateshead Gas Company, who have the privilege of supplying the town and district with gas, have admittedly for many years enjoyed the notoriety of supplying gas remarkably cheap, and remarkably pure, in both respects keeping far below the standards imposed by Parliament. But on one day last December, and on one day in last January, the sulphur impurities were found by the corporation gas examiner to exceed the prescribed limit of 20 grains per 100 cubic feet. For this the delinquent company was duly brought before the local magistrates, and, although it was shown in evidence that the cause of the increase in sulphur was not known—Mr. Pattinson, the gas examiner, saying "that he could not account for the impurity of the gas except that the purifying apparatus was not so good as it might be"—they were fined £10 and costs. Indeed, the case having been brought forward and proved, the magistrates had no choice but to administer the law. The excess of impurity was evidently due to unavoidable accident, very possibly to an increased make of gas, since the sulphur compounds always give most trouble just at the period of maximum make. Mr. Pattinson admitted that the purity of the gas during the past few years had been very satisfactory; and yet he thought "the purifying apparatus was not as good as it might be." The English law has always recognized that no person is culpable for the consequence of "unavoidable accident," and accepting this spirit, it follows that the provision under which the Newcastle Gas Company was fined was intended to protect the gas consumers against the consequences of negligence, of which the opinion "that the purifying apparatus is not so good as it might be" is rather a loose definition. The ultimate result of this hair-splitting policy on behalf of the Newcastle corporation, will be the providing of large additional purifying plant on the part of the gas company—and who will have to find the interest on the capital so expended? The gas consumers of London pay one penny to twopence for 1,000 cubic feet more than would otherwise be necessary in order that the gas may be maintained up to a fanciful standard of purity in respect to sulphur compounds; and, thanks to the action of their representatives, it is not unlikely that the gas consumers of Newcastle will eventually follow suit.

A paper entitled "Gas for Light and Work in the Workshop," read before the Manchester Association of Employers, Foremen, and Draughtsmen," by Mr. Thomas Fletcher, F.C.S., of Warrington, a few weeks since, is worthy of passing notice, and, indeed, of something more; for it may be useful to many as a permanent record of almost a distinct branch for the application of gas. Commencing with some practical remarks as to the most economical method of lighting workshops, Mr. Fletcher proceeds to notice the utility of gas blow-pipes, and small gas furnaces. He exhibited a small portable or table forge, by means of which a seven-eighths inch round bar could be raised to welding heat in ten minutes, starting all cold. Mr. Fletcher is well known as the manufacturer and original inventor of many appliances for the purposes above alluded to.

From a Parliamentary return, recently published, I learn that the total amount of capital actually paid up and invested in statutory gas undertakings in the United Kingdom, on the 31st December, 1883, was about 52,000 millions sterling; the numerous array of small undertakings not large enough to incur the expense of obtaining statutory powers, which exist in all parts for the supply of villages, small towns, large factories, etc., are, of course, omitted from the above return. Of this large amount of capital about two-thirds is in the hands of joint stock companies, and the remaining one-third belongs to local authorities. The return also sets forth that the total quantity of coal carbonized was 7,631,304 tons, which produced nearly 77,000 millions cubic feet of gas, of which quantity rather more than 70,000 millions were sold. The total number of consumers is stated to be something over two millions. As the total population is somewhere about 36 millions, it appears that in the British Isles one person in every eighteen enjoys the privilege of periodically paying a gas bill. The number of inhabited houses is

about six millions; so one house in every three is lighted with gas. For the distribution of this quantity of gas there are nearly 20,000 miles of gas mains; and the total number of public lamps is put at 375,536. These figures, of course, cannot be taken as more than a rough approximation to truth; but, as such, they serve to illustrate the importance and the magnitude of the gas industry in the United Kingdom.

The Cleaning of Boilers.

The *Locomotive*, in dealing with the above-named subject, makes the following suggestions:

Following the application of any boiler purger or other substance for loosening scale or deposit upon the shell, heads, or flues of a steam boiler, special care and attention should be given to cleaning out the boiler, with a prompt removal of such loose fragments as may have become detached and fallen down. These particles, if not removed, are often swept about by the various currents within the boiler, and, collecting in a conglomerate mass upon some part of the fire surface, prevent access of water to that particular part, and thereby it is overheated and is bulged—or bagged, as it is sometimes called—often inflicting a dangerous injury to the boiler, and requiring a considerable outlay for new sheets, a patch, or perhaps other expensive repairs. In the use of soda and other preparations used for removal of boiler incrustations that are soluble in water, a separate vessel may be provided, suitably connected to the feed-pipe, so that the preparation, in its proper proportions as recommended, may be first dissolved, and, when properly prepared, fed into the boiler. When there is a heater the solvent may be prepared and emptied into that. Logwood or oak chips, leather clippings, and many other waste products of a manufacturing establishment that contain some useful ingredient, as tannin, soda, or starch, may often be used advantageously when they are recommended and their use directed by an inspector; otherwise serious difficulties may result—perhaps endanger the safety of the boiler. We have known silk fabrics and other delicately-fine articles to be ruined in the dyeing process by the too free use of boiler compounds of which the users were ignorant in two essential particulars—viz., as to their composition and the safe quantity to be used.

The importance of knowing these particulars will be evident when we remember the great tendency of the boiler to foaming when purges are used, and the increased danger at such times of carrying over some of this water mingled with steam to the dye kettles, or wherever it may be used. We should not have a great deal of sympathy with the man who, declining to avail himself of the services and advice of a physician, ruined himself by dosing with all sorts of nostrums of which he was ignorant; but such a man at the worst can but ruin himself, while another who persists in dosing his boiler may not only lose his own life, but he may sacrifice many other lives in the same foolish way. We know of an instance in which a party who had some condemned bacon in his storehouse which he thought to use advantageously in cleansing and lubricating his boiler, he having somewhere read that grease was an excellent thing for the purpose. As he described it afterward, the boiler turned nearly inside out, and he fondly hopes that he may live long enough to get even with the man who recommended it to him. Another case was that of a fireman, whose duty it was, under the direction of the engineer, to fire and keep clean a battery of boilers, who, happening to hear some of his mates say that oil was an excellent thing for softening scale, thought to make a trial of it on his own account. So one Sunday, when cleaning out his boiler, he went through the shops connected with the establishment and gathered up the refuse oil and grease from various drippans, securing in this way two or three gallons, which he poured into one of the boilers, and afterward filled it with water. Soon after the steam was got up the fire-sheets became bagged and beautifully corrugated, and leaked like a sieve.

In boilers under our supervision we have used crude petroleum many times for the purpose of loosening scale, and with the most satisfactory results. We do not approve of the use of grease, and we deem the application of animal oils or fat to the interior of a boiler for that purpose as very hazardous. As a rule, when a boiler is in service, a systematic daily charge of a proper solvent graduated to the capacity of the boiler will be found more efficacious than a larger charge at longer intervals, and is less likely to cause foaming and kindred difficulties. An important matter sometimes overlooked is the need of regular times for it. When about to put a boiler out of service for a thorough cleaning, it will be found an excellent plan to let the boiler cool off gradually and the pressure fall slowly until it has reached about 5 pounds, when the safety-valve may be raised and the remainder blown off. Run off the water and remove the hand-hole plates, when the scale will be found much softened and easily detached, while the deposit can readily be washed off with a hose. We have found this an excellent plan to pursue even in marine boilers using sea water and depositing a very refractory scale, as the waters of the North Atlantic or Gulf of Mexico. Blowing down a boiler between the limits of high and low water—or, in other words, between the upper and lower gauge-cocks—is often very beneficial, and assists materially in freeing it from the ill effects of scum and other impurities. If, however, this blowing down is not intelligently done, there is a probability of great waste and serious loss; for in blowing out good water at the temperature of the steam pressure and replacing it by other water, perhaps of no better quality, at the much lower temperature of the feed, there is a great loss of heat and consequent waste of fuel. Blowing down a boiler can, however, under no circumstances be depended upon to thoroughly clean the boiler and remove the loose fragments of scale and much of the deposit commonly found. This can only be done by systematic periodical washing out at intervals to be determined by the circumstances of the case.

Compressed Oil Gas Illumination.

Our English contemporary *Iron* avers that in the face of the occasional outbursts of just indignation on the part of the traveling public of this country at the dismally lighted trains by which they are compelled to travel on some railways, it is refreshing to know that progress continues to be made in many quarters towards the establishment of a better state of things. The electric light is said to be promising well on some lines, and on one at least—the Brighton—we believe it is keeping its promise; but we are not in a position to answer for the others. Ordinary coal gas, too, we are informed, is looking up on another line. In the face of all this, however, the use of Pintsch's compressed oil gas system for lighting railway carriages is steadily advancing on our leading lines of railway, it having been adopted on eleven of them. To come to figures, we may state that the Great Eastern Company take the lead with 592 carriages so lighted. The London and South-Western follow, with 553 carriages; the Metropolitan District Railway, with 350; the Metropolitan Railway, with 301; the Glasgow and South-Western, with 250; the Caledonian, with 208; the South-Eastern, with 154; the Midland, with 121; the Mersey Railway, with 56; the Great Western, with 38; the North British closing the list, with 36. This gives a total of 2,659 carriages thus lighted on English railways; but this is only a small proportion of the number of carriages fitted in England and on the Continent inclusive, the grand total being more than 17,500 in all countries, and this is exclusive of a number of locomotives which are fitted with head-lights on Pintsch's system. Satisfactory as this is, it is not all; for the use of gas lighted buoys on this principle continues to increase. Two have recently been despatched to Canada for use on the St. Lawrence, whilst three have been added to the nine already in use on the Clyde. The *Garmoyle* lightship is now being altered from an oil-lighted vessel with a crew to an oil-gas-lighted ship without one, which means a great saving. The light will be one which will burn for six weeks without attention or recharging the gasholder. Beyond this, the company owning Pintsch's patents are working out a plan for placing a light on the Gantoch Rocks. They put up some small gas works for the Trinity House at the South Foreland in connection with the lighthouse experiments there, and which we understand proved very successful, and have formed a special feature in the experiments. On the whole, then, it will be seen that Pintsch's compressed oil gas system, of which we have always written hopefully in the past, fully justifies the confidence we have expressed in it. Having taken root in this country, it is spreading rapidly in all directions; and those railway directors and managers who have not permitted their judgment to be warped by prejudice are to be commended. Only one word of caution would we give to these latter gentlemen, and that is, having a good thing, let them not be stingy, and dole it out to the public in a half-and-half sort of way, as some are wont. They need not be wasteful, but they should not be stingy. There is all the difference in the world between extravagance and penuriousness. We believe the cost leaves a liberal margin for a generous light, which the public have a right to expect, and which it will be to the advantage of railway companies to give them.

Natural Gas and its Uses.

"Rivet," in a recent communication to *Mechanical News*, writes the following:

During a recent visit to Western Pennsylvania I was much interested in the application of natural gas to smelting and heating purposes. At one furnace that I visited the gas was brought in a six-inch cast iron main about 20 miles, and at the place where it was used gave a pressure of about 75 lbs. to the square inch.

For heating purposes, either for making steam or domestic purposes, the ordinary grate is filled nearly full of broken fire brick—the pieces being about the size of egg coal. The gas is admitted to the under side of this grate full of broken brick and ignited on top. The heat produced is very intense, and on its first application has to be watched with great care until the desired flow is secured to produce a uniform heat. One of the peculiarities of the gas is its freedom from odor, hence its use is rather dangerous, and

already several serious explosions have taken place in consequence of imperfect connections in pipes used to bring the gas into buildings for use.

Many manufacturing concerns do not attempt to stop the flow of gas when they have completed their day's work, but turn it into a pipe leading into the open air, and let it burn all night, or until it is wanted again, thus reducing the liability to explosions by permitting it to flow freely into the open air.

It would be almost impossible to tell the number of gas wells in and around Pittsburgh. Besides those already in use as many more are being sunk in hopes of striking a good flow. I am informed that the depths of these wells vary in a large degree, undoubtedly depending much upon location. Those already in use range from 1,500 to 2,800 feet. The well men say you must go deep enough to strike the second layer of sand before a good flow can be secured. The wells are usually sunk to receive a six-inch iron pipe, although several have been put down where an eight-inch pipe has been used. Where this has been done smaller wells have been first made, and the larger ones made to get an increased supply. I understand that the gas company for lighting the city use this natural gas with that which they manufacture, and thereby greatly cheapen the production. Where the natural gas is used for domestic purposes its cost is about one-third less than coal for the same purpose.

One gentleman informed me that he used it in an ordinary cook stove, and said it was perfection in the way of heat. He used the broken fire brick as already described. Having occasion during the cold weather to be absent from his home with his family for several days, he regulated the flow of gas to his stove and went off and left it for three days, to return and find his home as warm and comfortable as when he left. He said the greatest trouble he experienced was a variation in the pressure from what were to him unknown causes. This he said was not general, but applied particularly to the well he was using. Already there had sprung up in Pittsburgh and vicinity the invention and manufacture of gas regulators that would undoubtedly overcome the trouble of variable pressure.

When I asked him what he thought of the duration of the supply, he said no one could tell. There were some wells that had been in use about a year, and he presumed that there were others even longer than that, and still there is no perceptible abatement in the flow.

While on this subject of gas wells I give another one. About seven miles south and east of Mt. Vernon, Ohio, there has been for years a lamp black factory. The lamp black is made from gas from a natural well; and to show you the extent of the business, over 90,000 jets are in use, and the black thus made is of a superior quality, and commands a much higher price in the market. The owner began in a small way, and has by degrees added to his buildings until now he has the largest factory in the world. I understand that the lamp black thus made is used for the best kind of carriage and car painting.

An English Establishment for the Storage of Petroleum.

Engineering, in an article descriptive of the methods employed by the firm of Messrs. Ingall, Phillips & Company (London), in storing the vast quantities of mineral oils constantly arriving at their works, explains that the before-mentioned factors are large storers of petroleum, they having three large establishments, viz., Dudgeon's Wharf, Mellish's Wharf, and Palmer's Wharf, all on the Thames. The former is the most recent addition to their business, and it is also the most extensive and best arranged. Those who remember Dudgeon's shipyard in its prosperous days would scarcely recognize it now converted into an oil storing depot. The front of the slipways has been built in by a broad wall which serves as a landing wharf. The vessels which bring the petroleum generally lie moored in the tier adjacent off Cubitt Town Pier. From there the barrels are transferred to dumb lighters, of which the firm possesses about twenty, and are brought alongside the quay, where are three steam cranes, two of 30 cwt., and one of 3 tons capacity. The barrels are lifted out of the lighters by these and placed on an elevated wooden staging. This is of such a height that the barrels will run over the special railroad provided to the extreme end of the premises without any more labor being expended on them; in fact, when a barrel of oil comes on to the wharf to whatever part of the premises it may have to go the transport is always effected, excepting in very rare instances, by its own gravity. It should be here mentioned that there is an addition to the quay space referred to which is formed by a dock about 200 feet long. This has been lined with a bed of chalk to prevent the flat-bottomed barges from "sucking," as they are apt to do, on the mud, and so not rising with the tide when fully laden.

From the staging mentioned the barrels run on a railroad to the weighing machine which is placed in the middle of the premises. This forms a central junction for the numerous roads laid down throughout the works. The old method of forming the railroad for the barrels to roll on was by means of 3½-inch iron pipe, the different lengths being screwed into sockets. Two lines of pipe were supported on wooden sleepers, and placed a sufficient distance apart to allow the bilge of the casks to fall between them. There was a serious disadvantage in this arrangement inasmuch as each time the barrel passed over a junction of the two ends of pipe a jar was given to it, and the constant repetition of this soon caused the barrels to leak. The ways are now formed of light tram rails, which are specially rolled for the purpose by the Rhymney Iron Company. They are joined by fish-plates in the ordinary way, and are much stronger than the old pipe roads. There are several elevated roads formed entirely of these rails at Dudgeon's Wharf, and the barrels roll about without attention on the ground or overhead in all parts of the works. The standard gradient is now 3½ in. in 20 ft., which has been found in practice the most suitable; 4 in. in 20 ft. was the gradient used with the old pipe roads. From the weighing machine the majority of the barrels pass on to an automatic elevator on the endless chain principle worked by a 16-horse power gas engine, which lifts them to an upper floor of a large building known as the emptying floor. Here there are nine troughs, about 66 feet long, let into the floor. They are of rectangular section, 12 in. wide by 12 in. deep, and are formed of wrought iron plates riveted together. The barrels are rolled over them, and the bungs being taken out, the oil runs out. The barrels being emptied they roll on, still by gravity, until by a suitable road they are taken to the yard where empties are stored, or else are conveyed back to the barges to be shipped away. The nine troughs in question lead into another large trough placed at right angles to them, and into this the oil flows. From thence it runs through an iron shute, also used as a footbridge, into the receiving tank, which is, like all the other tanks, made of wrought iron plates riveted together. The receiving tank is cylindrical in form, 16 feet deep and 32 feet 9 in. in diameter, and will hold 2,000 barrels. It is enclosed by a brick wall.

From the receiving tank the oil is pumped into any of the storage tanks, of which there are thirty-two in all. Their collective capacity is 56,000 barrels, there being 40 to 42 gals. to a barrel. The principal group of tanks is placed in a large sunken pit on the old slipways, the ground having been excavated for the purpose. Twelve of these are circular, 32 ft. 9 in. in diameter and 26 ft. deep. Six are rectangular, 13 ft. by 13 ft. by 26 ft. Six more are circular, 7 ft. 6 in. in diameter and 26 ft. deep. There are two other smaller groups in another part of the premises. From these tanks the oil is pumped out into barrels as it is required to be delivered to the owners. The pumps for filling and emptying are seven in number. Four are situated close to the cask elevator referred to, and are driven by the gas engine which works it. They are 3 in. rotary pumps, and are said to give very good results. For emptying or filling the tanks respectively the pumps are simply reversed, the operation being performed by open and crossed belts. Arrangements have been made for a further number of these pumps, and, indeed, the whole work is designed for considerable further extension, the business of Messrs. Ingall & Phillips having been continually and rapidly increasing up to a short time back. The other pumps are of similar construction, but are placed in a separate house near the wharf. They are worked by a vertical steam engine.

For filling the barrels there are two sets of apparatus. The more modern of these is situated on the same level as the emptying floor. The arrangement consists of a pair of rails for the barrels to roll on, between them being a trough to catch waste. The oil is pumped through a service of pipes from the storage tanks, and a nozzle is inserted into the bunghole by means of a universal joint, as flexible pipe is hardly admissible on account of the penetrative and solvent properties of the oil. It is calculated that this apparatus will fill 1,000 barrels an hour when complete.

A barrier 4 ft. high and 2 ft. 6 in. thick, formed of two walls of brick with puddled clay between, separates the premises from the public road, so that in the event of a sudden rush of oil, say in the case of fire, the neighborhood would not be inundated. There are also other walls of a like nature, as well as banks erected in various parts of the premises, in order to isolate different sections. There are several other elevators in different parts of the works similar to the one we have referred to, and the whole network of roads is laid out in such a manner that whenever a barrel arrives at the lowest part it can be lifted by an elevator so as to be on another falling gradient for transportation back to any part. In this way, and by means of crossings and junctions, a barrel of oil can be conveyed to any part of the works without being rolled by hand. It is needless to say that for filling and emptying the tanks there is a vast service of pipes. These are all of wrought iron, the mains being three inches in diameter. They are connected by ordinary screwed joints. On the whole, it would seem that Messrs. Ingall, Phillips & Co. have studied the question of the storage of mineral oil very carefully, and have brought the system to a great degree of perfection. We trust they may have a renewal of the success which their enterprise and energy should entitle them to. When the tank vessels for carrying the oil from Batoum are run into the Thames, the whole system of conveyance and storage of petroleum will have been greatly simplified and cheapened, a fact which should considerably influence the price of the commodity.

The Petroleum Situation.

Stowell (writing under date of Feb. 20), in reviewing the situation since opening of markets on Jan. 1, 1885, declares that the course of the petroleum trade for the year so far has been as devoid of excitement as it has ever been in the same space of time. While with every succeeding month of the latter half of last year we have had to chronicle the advent of still larger wells than came in during the preceding month, the present year has not brought in as yet a single well which might justly claim the title of "gusher." With this absence of any single large producer, there has been a steady decline in the output of the oil wells, so that we have to register for last month a very much decreased daily average, which by this time is still further diminished, and might be expressed in round numbers as 50,000 barrels.

Throughout January and the early part of the present month the Gantz well, in Washington county, has received a great deal of attention—considerably more, as the result shows, than it has deserved. The well was drilled in December by the Citizens' Fuel Company, of Washington, to a depth of 2,200 feet. A small show of oil was obtained at this depth, when the well was tightly plugged, boarded up, and worked as a mystery. Rumors regarding the condition of the well and the prospects of its being a gusher were rife throughout the weeks that followed, but nothing was done at the well until on Jan. 26 the plug was removed, and the well made a flow which lasted 45 minutes, and which amounted to about 50 barrels. After this brief flow the well stopped, and drilling was recommenced, as reports go; several delays were occasioned by accidents, and little progress was made. A very small flow was made on Feb. 1, which lasted for but five minutes, and after which no more oil could be gotten out of the well. It was then decided to shoot it; and after two charges had been exploded in the well another brief spurt ensued. This ended the production of the well for the present. The owners are at present drilling the well deeper, and will put in a pump; but the chances for a Washington county gusher are not very flattering.

But very slight fluctuations in the market were caused by the variable conduct on the part of the Gantz well. On Jan. 19, however, the market experienced considerable excitement. Grandin well No. 28, in the Balltown district, which has been looked upon as practically dead territory since last summer, came in with a reported production of 400 barrels per day. This arrival in so unexpected a quarter was a decided surprise to the market, and prices were knocked down a couple of cents, but soon recovered their equilibrium when the well settled down to 150 barrels a day.

About January 23 the Macksburg field attracted a little attention, owing to the performance of the Syndicate well, which was at that time putting out 150 barrels of the 800 barrels daily production of that district. Nothing startling was brought to light here, and the trade relapsed into great dullness. The Phillips well No. 1, on the Mushrush farm, was the only prominent feature in the situation; but the process of development at this well was very slow, and very little excitement was occasioned when it did come in. During the present month the course of trade has been quite monotonous, the only features being the "mystery" work at the Clark & Sutton well on the McLaughlin farm, which at this writing has not yet been brought in, and the flow of Fisher No. 4, on Feb. 4, which broke the market slightly, but which at the present writing is doing but 50 barrels.

The range of prices during the past month and the portion of this month under review has been limited, and, in spite of favorable indications, has shown little disposition to advance. This must necessarily suggest that influences foreign to the questions of supply and demand are being exerted to keep prices at their present level. It is, of course, always possible to do this, and where manipulation exists it is useless to endeavor to forecast the future of the trade from field indications. Hence it can only be held that the situation as regards production and consumption is very favorable, and that, if in any measure set free from extraneous influences, we may expect to see much better prices in the near future.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Exporting American Engines.—A certain evidence that excellence attaches to the Westinghouse Machine Company's product is produced when we mention the fact that these Pittsburgh manufacturers are shipping engines to Europe, such orders principally coming from England and Holland. One of the recent orders comes from the British Admiralty Board, a 15-horse power automatic engine being the class purchased; the South Kensington (London) Museum authorities have also purchased a 9½ x 9 engine, which is intended to actuate the electric lighting dynamos of that institution. The engine is calculated to perform as high a duty as 550 revolutions per minute.

Calling for Bids for the Erection of Gasholders.—The attention of contractors and builders of gas works plant is called to the advertisement of Mr. F. H. Hambleton, chief-engineer to the Consolidated Gas Light Company of Baltimore, Md., which will be found on page 129 of this issue. Mr. Hambleton therein invites proposals for the construction of two telescopic holders, each of about 87 feet diameter, with 45 feet lift. The date when proposals may be handed in closes with March 20.

Giving an Account of his Stewardship.—Mr. Edward L. Wood, who has held the position of Treasurer to the Lewiston (Me.) Gas Light Company for nearly eleven years, and who for some time past has been desirous of being relieved from the duties of that office, finally determined to sever his connection with the corporation toward the close of 1884. Prior to handing in his resignation Mr. Wood submitted the following statement, rightly believing that such procedure would most clearly portray the manner in which the interests confided to his care had been handled. It might be said that Mr. Wood assumed the Treasurership of the company at a time when its affairs were not in the brightest possible condition.

Trial Balance, June 2, 1873.

Capital		$150,000 00
Notes payable		42,155 66
Profit and loss	$45,511 67	
Plant and real estate	130,777 52	
Cash assets	13,966 47	
Taxes due, unpaid	1,900 00	
Totals	$192,155 66	$192,155 66

Trial Balance, November 30, 1884.

Capital		$75,000 00
Notes payable		6,309 99
Profit and loss		2,836 51
Plant and real estate	$74,703 12	
Cash assets	8,434 38	
Taxes, paid six months in advance	1,000 00	
Totals	$84,137 50	$84,137 50

A 3½ per cent. semi-annual dividend, due and paid Jan. 1, 1885, taken out of cash assets, leaving 1884 figures net. The company could also dispose of land valued at $20,000, and still have sufficient ground area left for all possible future enlargements. We have not been informed as to who was appointed in Mr. Wood's place.

Predictions Verified.—Several of our city engineers predicted that the arrangements for getting at the carbon points in the arc lamps on the Hell Gate tower would prove of little value during some of our winter storms. The man who attends to the changing of the carbons ascends to the top of the tower in a skeleton car held in place by two steel wire guide ropes, each three-quarters of an inch thick. On three or more occasions during the past winter, owing to the occurrence of sleety storms, when the tower ironwork, and the steel guide ropes as well, became encrusted with ice, the elevator car refused to budge and the lamps remained unlighted. It might be here added that no great catastrophe occurred through the failure of the illumination on those stormy nights; and if the whole truth were told it would not make much difference to the East River and Long Island Sound navigators if the tower arcs remained extinguished on every night.

Judge Ewing Refuses to Grant the Injunction.—In our issue for Feb. 16 it was reported that Moritz Wolff and another, residing at McKeesport, Pa., had made application before Judge Ewing for an injunction restraining the National Tube Works Company from proceeding with the laying of a main for the conduction of natural gas underneath the roadway in front of plaintiff's premises. When all the testimony had been submitted Judge Ewing said that, all things considered, he would deny the prayer of the plaintiffs. His Honor said that the case was an important one, and the weight of testimony produced by defendant conclusively proved that the main laying operations were being conducted in accordance with the best approved modern practice. Some interesting expert testimony was developed by the hearing. Mr. W. S. Jarboe gave it as his opinion that the joint employed by the National Tube Works Company on this disputed line of pipe was superior to anything else of the sort that he had ever seen. William E. Russell, Boiler Inspector, Allegheny County, Pa., testified in a similar strain. He thought the joint was so fully re-inforced that the pipe itself would break before the joint would be ruptured. Messrs. Thomas Shelton, John McCaffrey, and R. J. Wilson gave similar evidence.

Rochester Electric Wires Cause a Fire.—About 1 A.M. on the morning of Feb. 10, W. J. Savage, night operator at the central telephone office, No. 73 East Main street, Rochester, N. Y., discovered that the tower of the building was on fire. An alarm was sent out, and prompt action by the fire-

men soon put an end to the danger. The fire was caused by the crossing of the electric light and telephone wires—the latter entering the building through the tower. Damage to the amount of $750 was caused.

FLATBUSH (L. I.) STREET LIGHTING SQUABBLE.—Flatbush is a pretty suburban village and township adjoining the southeastern end of Brooklyn city. It has a population of about 7,000 souls, and is chiefly notable to outsiders as affording a site for the public buildings of Kings County—these latter including the almshouse, nursery, hospital, and lunatic asylum. The burial ground known as the Cemetery of the Holy Cross is also encompassed within the township limits. The place is well laid out, has a plentiful water supply, and boasts of a very "exclusive" set of residents, some of these proclaiming that their ancestry may be traced back to the original Dutch settlers of the year sixteen hundred and something. Another thing of which the "Flatbusher" is very proud is that venerable "Erasmus Hall" (the first regularly incorporated college in the State of New York) still holds open wide its doors for the reception of the student; but the old seat of learning, while yet training the "young idea how to shoot," has long since degenerated into an ordinary sort of "day school." The visitor, too, may always count on having pointed out to him the structure, with its stuccoed front and "Dutchy" spire, known as the Reformed Church. The aspect of the country is uniformly flat and low, and one might hunt over the rich farming lands of the locality for days at a time without finding the sign of an obtruding rock. We mention some of these things in order to show that not much trouble is encountered by the Flatbush gas man, when it comes down to the question of conduit extensions. Flatbush has a gas company whose operations have extended over a period of many years; and it is rather a model gas plant in its way. Its owners have enjoyed such a "soft thing" of it, though, that they are not inclined to make much exertion in the direction of extending their output by reducing selling prices. Still, if they do not wish to extend their business ramifications, they do desire most ardently to hold on to what they now enjoy—and get the old-time prices for the service. The town authorities recently came to the conclusion that $35 per annum was a pretty steep price to pay for each public lamp, and so it was determined, shortly before the lighting contract was to be renewed, that an effort should be made to have the charge reduced. The lighting is carried out on the basis of a "moon-table," and the total number of public lamps is 225. It would strike the average observer that $35 was a fairly round figure for the service, and might possibly admit of being reduced somewhat without any injustice being done to the gas purveyor. At any rate, the Road Commissioners suggested that $30 would be a fair figure; but the gas company said "no," and further intimated that if the Commissioners insisted on the latter terms out would go the lights. After much higgling between the interested parties it was finally decided that the township should pay the sum of $33 for each of the 225 lamps. The Flatbush gas works proprietors would not stand in need of condolence even did the Commissioners insist on the $30 rate.

AWARDING THE BROOKLYN (N. Y.) STREET LIGHTING CONTRACTS.—On February 16 the Brooklyn (N. Y.) Board of Aldermen finally determined to authorize the execution of the annual contracts for street lighting for 1885. The city fathers repeated their attempt of last year to get the companies to assent to a reduction on the original bid price, but the scheme, unlike last year's result, came to grief. The companies remained firm in their adherence to the original figures submitted, and the contracts were awarded on that basis. Although the bids have been once published in the JOURNAL, it may possibly be in order to mention the figures over again. The following is a summary:

	Street Lamps.	Public Buildings.
Brooklyn Gas Light Company.....	$19.80	$1.50 per M.
Citizens " "	22.00	1.75 "
Metropolitan " "	22.00	1.75 "
Nassau " "	22.00	1.75 "
Peoples " "	22.00	1.75 "
Williamsb'g " "	21.75	1.75 "

The cost of lighting, extinguishing, repairing, and cleaning is included. The lamps are to burn all night and every night in the year; and the rates at which the service is performed would seem to be pretty low ones. We have not been informed as to the action taken in regard to the electric lighting propositions, but it is fair to presume that of the $15,000 voted by the Board of Estimate for the maintenance of a partial system of arc illumination there will not remain a very large "unexpended balance" at the end of the twelvemonth. In 1883 the Aldermanic body of the City of Churches did not award the lighting contracts until well into the summer, and some ugly rumors were circulated as to the cause of the delay. Last year the awards were made during the month of February, and while some greater show of punctuality is being exhibited in attending to the execution of Brooklyn's street lighting contracts, one would be inclined to think that arrangements for concluding the same might take place at a date much closer to the period from which the actual work of lighting commences—Jan. 1st of each year.

INDIANAPOLIS (IND.) GAS LIGHT COMPANY MAKES A PROGRESSIVE MOVEMENT.—At the meeting of the Indianapolis City Council, held Monday, Feb. 16, the Committee on Public Light handed in a report which brought with it a statement that a new arrangement had been entered into between the city's representatives and the Indianapolis Gas Light Company, by which the price of gas to private consumers was to be reduced from $2.00 to $1.80 per thousand, while the public lighting service was to be increased by the addition of 240 hours to the lighting schedule time of each street lamp—the cost of lamps to remain as before—$25 per post. The consideration given by the city in return for these concessions on the part of the gas company, is the extension of what is known as the "general" contract for the period of ten years from first of March. The "special" contract (the duty of this latter being to define lighting table, size of burners, etc.) was also extended for the period of three years, but the lighting table of same, as before stated, was amended by the addition of 240 hours' service for the lamps; each burner will now perform a total annual duty of 2,740 hours. The "general" contract contains a proviso under which the city can abrogate its working (should the authorities see fit to institute electric lighting, but for no other reason) by giving the gas company a ninety-day notification of that intent. When the report of the committee had been read an ordinance in accordance with the purport of committee's conclusions was introduced; this action brought about a general discussion of the question, and the sentiment of the members was almost unanimous for its ratification. Under a suspension of the rules the ordinance was passed by a vote of 17 to 2—Messrs. Dowling and Thalman alone opposing. Mr. Thalman, in explanation of his vote, said he preferred that the old contract should be allowed to expire by limitation before the new one was entered into—the existing "general" and "special" contracts having some time yet to run. Immediately upon the passage of the ordinance the contracts were awarded, Mr. Dowling alone voting in the negative. Mr. James Somerville, engineer to the Indianapolis Gas Light Company, was among the earliest champions of cheap gas prices in this country, and always "practices what he preaches." The plant over which he has engineering control is kept abreast of the best lines of modern practice, and with his skilful management it may be counted upon to retain the prominence of its present position. The Indianapolis *News*, in editorially commenting on the recent action of President Fletcher and Engineer Somerville, says: "The action of the gas company will, we are sure, be duly appreciated and credited. It is in the general line of policy which has guided it for some years; a policy which has wrought a better understanding on all sides, breeding the spirit that the company's interests were identical with the people's, and that advantage to both lay in agreement, not discord. * * * * The city is now well served, and we may confidently look for a maintenance of the course which has brought it about." Not a bad way to have your neighbors talking about you.

SOMETHING FROM DENVER, COLORADO.—Mr. W. J. Fay, the controlling spirit of the Denver (Colorado) Gas Light Company, writes us that the annual meeting of the stockholders of that corporation was held on Tuesday, January 20th. The various reports submitted gave ample proof that '84 was a prosperous year for the Denver Company. This fact only goes to show the thorough business policy of reducing selling rates—the Denver folks having made a considerable decrease in their charge to consumers during the last year, note being made of the same, at the time of its happening, in the item columns of the JOURNAL. The election of officers for year 1885 resulted in the choice of Mr. G. W. Clayton as President; Mr. W. B. Mills as Secretary; and Mr. W. J. Fay as Vice-President and Superintendent. These were all re-elections, equivalent to a stockholder's verdict of "well done, good and faithful servants!"

CHASING OUT THE ELECTRICAL PROMOTERS.—If ever there was an authentic case on record where the electric folks had, at any one time, complete control of the lighting of a township, that case was exemplified at Cheyenne City, Wyoming Territory. For three or four years the inhabitants of that place were dosed with all sorts and conditions of electrical illumination—arc and incandescent, Brush-Swan storage batteries, etc., to say nothing of the side-shows, which generally consisted in the application and employment of candles, kerosene, torches, and the like, when the "current ceased to flow." No gas company to plunder the residents, no meters to swear at—although they were hardly necessary as incentives to profanity of the extra-superfluous sort, for the electric medium's eccentricities were always present to furnish impulses of that nature. Some of the more venturesome spirits of the place finally decided that "electricity must go," and to hasten the time of its exodus set about organizing the Cheyenne City Gas Company. In May, 1884, ground was purchased and the work of building a gas plant was immediately begun. Construction operations were prosecuted with such vigor

that distribution of illuminating gas to consumers was commenced on September 15. So great has been the success of the enterprise that the output during the month of December last averaged over 25,000 cubic feet per diem. So we see that Cheyenne City has reversed the supposed order of things, in so far as the establishment of an electric lighting plant demonstrated a need for the installation of a gas works. Verily, electricity is but "the light of the future."

How the Brethren Dwell in Unity.—On Feb. 13 suit was begun in the United States Circuit Court, Chicago, Ill., by the great balloonist, Prof. Lowe, acting in conjunction with the "Improvement Company," of Columbus, Ohio, against the Lake Gas Company, of Cook County, Ill., which concern, it appears, has been using apparatus and machinery erected by the "great and only" firm of A. O. Granger & Co., with headquarters at Philadelphia, Pa. Lowe and co-adjutors assert that Granger has no right to erect a particular water gas apparatus without first having obtained a license from the "chief inflator;" and having, as it is asserted in the Cook County instance, failed to secure (presumably to pay for) the Lowe permission, hence these prayers to the Circuit Court. The gas companies throughout the country know just where the Journal stands in regard to the doings of the water gas menagerie; its advice now, as it invariably has been in the past, is to keep clear of all of the parties to the carbonic oxide combination. The less one has to do with them the better he will be off. Let them keep on applying for patents, sending out circulars, and reciting their astonishing stories—these practices harm nobody, and evidently serve to amuse the practitioners. If one may read the signs of the times, it now looks as though the major portion of their cable had been "paid out."

An Electric Freak at Williamsport, Pa.—Quinn & Co.'s billiard parlor, located in a building on Willow street, Williamsport, was made the scene of quite a "scare" one evening last February. An incandescent lamp over one of the billiard tables "went off" with "no uncertain sound," and many of the losing billiardists, in explanation of why they were defeated, asserted that the offending lamp upset their nerves. What troubled Quinn & Co. most was the fact that particles of the heated carbon loop destroyed the cloth of a newly covered billiard table. They should burn gas. It is also reported, from the same locality, that on another date in February the town offices were subjected to a similar outbreak. An employee named Albert Wood was rather badly burned, and the ceilings of two of the rooms were scorched. The town authorities had better burn the light of the present.

Once More in the Gas Works Construction Business.—At one time in the history of gas plant construction in the United States the firm of Merrick & Sons was "a power in the land;" but from one cause or another the company drifted out of that particular branch of manufacturing, and devoted its energies to other fields. The old house, originally founded in 1836, afterwards became known as the Southwark Foundry—the Messrs. Merrick still retaining their interest therein. With the beginning of 1885 the proprietors of the Southwark Foundry determined to re-enter the lists of gas works builders, and now formally announce such determination to the gas fraternity of the country. The office address of the company is 430 Washington avenue, Philadelphia, Pa.

Personal.—Mr. T. A. Bates has resigned the superintendency of the Cairo (Ills.) Gas Light Company. John J. Rowe, formerly connected with the Lansing (Mich.) Company, succeeds to the berth vacated by the first-named gentleman.

It was only a Hoax.—Some of the Scotch newspapers recently indulged in a rather precise account and description of the discovery of a new cannel field in the Fifeshire district. In fact, from the particulars given (the aforesaid description having been reprinted by several technical journals published in this country) it was supposed that the "discovery" was tantamount to the resuscitation or rejuvenation of a seam of cannel which had been "worked out" some years ago, and which had been held in great esteem by the gas makers of the United States. One of our most extensive importers of English cannel immediately communicated with Mr. Henry Aitkin, of Falkirk, Scotland, in regard to the Fifeshire "find;" and the response received was of this nature: "The newspaper report of a new field in Fifeshire was a hoax. The account was sent to a Glasgow newspaper for the purpose of teasing two Fife coalmasters; but it appears that the story has since gotten widespread mention in the public prints. It is very amusing." The transaction undoubtedly was possessed of a humorous side; but it was nevertheless rather severe on the "newsgatherers of the press."

The Stacey Mfg. Company will Build the Holder.—On the 23d of February the contract for building a gasholder, of the dimensions of 135′x36′ inner, and 140′x36′ outer section, was awarded by the officials of the St. Louis (Mo.) Gas Light Company to the Stacey Manufacturing Company, of Cincinnati, Ohio. The holder will have 12 wrought iron columns.

Not the Gas Trust Plant.—Late on the afternoon of February 25th word was received at the Journal office that a fire had broken out in the works of the Philadelphia (Pa.) Gas Trust. Subsequent despatches conveyed the news that such was not the case, but explained that the coal tar reduction works of Messrs. M. Ebret & Co., located near the Gas Trust's plant on the Schuylkill River, had been partially destroyed by a conflagration which had been caused by a spark thrown out by a passing railway locomotive. Before the flames were extinguished damage to the amount of $15,000 was reported to have been incurred.

RECENT PATENTS.

The following list of patents relating to improvements in gas apparatus, etc., granted by the United States Patent Office since February 3, 1885, is specially reported for the Journal by Franklin H. Hough, Solicitor of American and Foreign Patents, 925 F Street, N. W., Washington, D. C.

Issue of Feb. 10, 1885.

312,106. Gas meter. G. Fajen, Milwaukee, Wis.
311,997. Water gas, method of and apparatus for enriching and burning. C. J. Eames, New York city.
312,193. Gas pipe holder. C. G. Duffy, Utica, N. Y.

Issue of Feb. 17, 1885.

312,431. Gas apparatus. W. M. Casler, Columbia City, Ind.
312,279. Gas burner. A. B. Lipsey, West Hoboken, N. J., assignor to W. Bell, New York city.
312,367. Gas burner. B. Martin, East Saginaw, Mich.
312,494—'97, '98. Gas engine. L. H. Nash, Brooklyn, N. Y., assignor to National Meter Company, New York city.
312,499. Gas engine igniter. Same as above.
312,541—'42, '43. Gas mains, detecting leaks in. G. Westinghouse, Jr., Pittsburg, Pa.
312,560. Gas pressure regulator. L. G. Francis, La Grange, Ills.
312,483—'84. Gas regulator, or governor. J. H. Luther, Olean, N. Y.
312,470. Gas under pressure, system for distributing. W. A. Hoeveler and T. J. McTighe, Pittsburg, Pa.
312,565. Hydraulic mains in gas works, discharging tar from. A. Hutchison, Providence, R. I.

The Market for Gas Securities.

The event of the fortnight was the listing of the stock of Consolidated Gas Company on the boards of the New York Stock Exchange. The Gas Consumers' Association had the assurance to hand in a protest to the Governing Committee of the Exchange urging that favorable action on the listing project be denied. The protest was not even read by the Exchange authorities, and the paper on which it was printed (or written) goes to make up the general collection awaiting the junkman's next call. The Consolidated Company asked to have its entire capital stock ($39,078,000) placed on the lists; but the Governing Committee refused to list the 36,000 shares reserved for working capital and the retirement of former bond liens and other old indebtedness.

The stock listed (354,300 6-10 shares) was issued in exchange for the old capitals in following proportion: 39,789 shares New York for 75,600 shares; 79,600 shares Manhattan for 119,400 shares; 30,000 Municipal for 66,000 shares; 25,000 shares Metropolitan for 65,000 shares; 39,860 shares Harlem for 28,300 6-10 shares. In the first trading the stock opened strong, and remained firm to time of writing (Feb. 28), closing at 83¾ bid, offered at 85. Even should Consolidated go lower (some wiseacres say it will), we believe it to be a purchase at or below present offering notch. Equitable and Mutual are fairly steady to strong.

Peoples, of Brooklyn, is higher. Auctioneer Jacob Cole, Brooklyn, sold the following securities on date of Feb. 26: $525 Nassau scrip, at 95–95¼; 10 shares Nassau, at 120; 16 shares Brooklyn, at 132¼. Chicago (Ills.) gas has advanced 3 points, and will go higher. Business in out-of-town securities, so far as this market is concerned, is dull. Forty shares Little Falls (N. Y.) gas was disposed of on a recent date at the low figure of 26¾. Warsaw (N. Y.) gas is firmly held at 95 to 100. Baltimore (Md.) Consolidated gas is stronger; Boston (Mass.) gas does not appear to have been materially, or even noticeably, affected by the Common Council's recent action. We are informed that Mayor O'Brien has signed the Bay State franchise. For regular list of quotations, see page 128.

MAP

showing the Location of the

PLESIO-BOGHEAD CANNEL COLLIERY

NEAR LEITH, SCOTLAND.

PROPRIETORS:

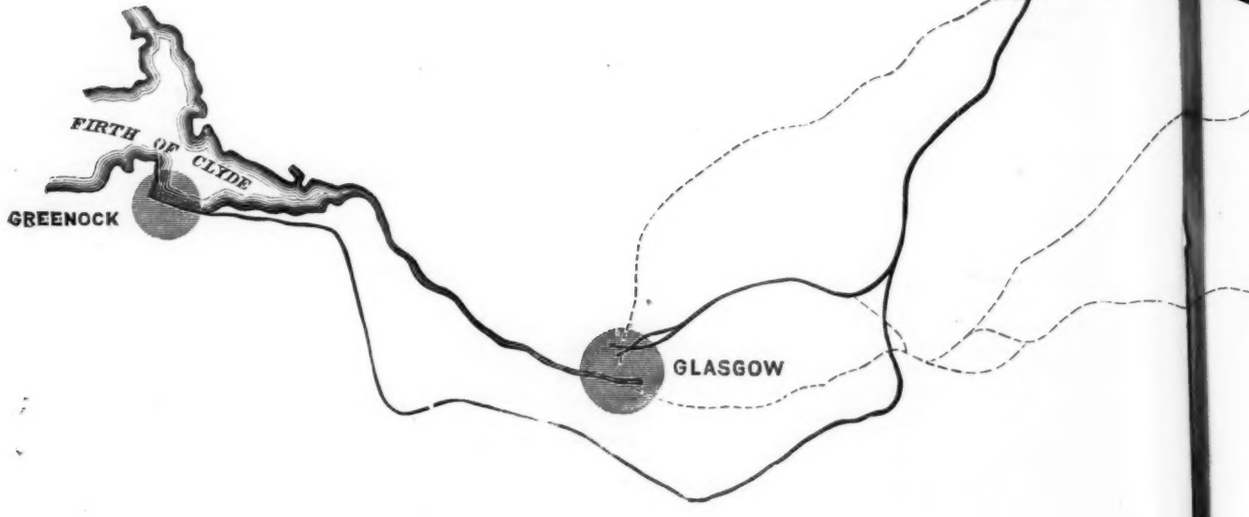
LOCHORE AND CAPLEDRAE CANNEL CO. LIMITED.

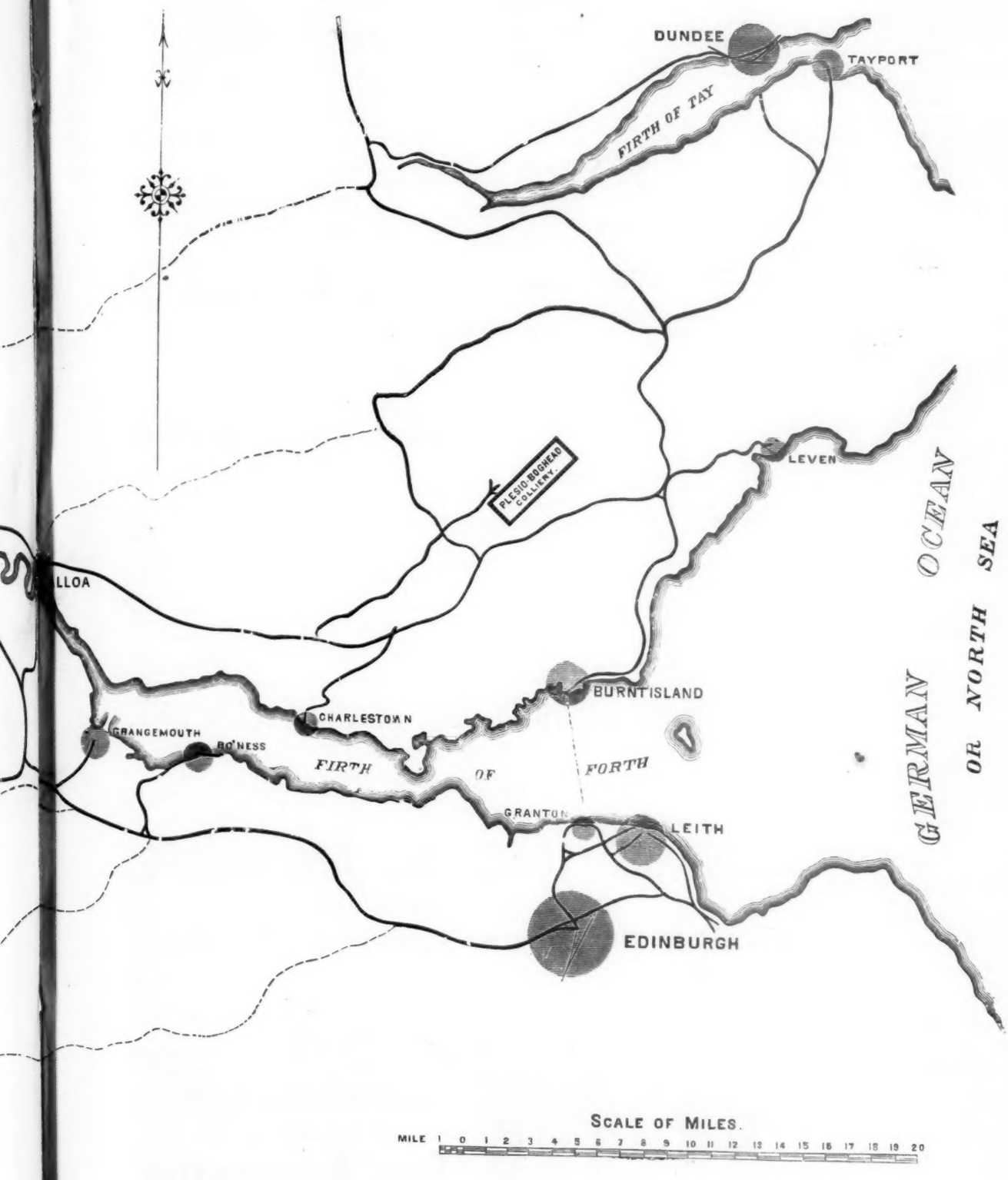
GENERAL AGENTS FOR UNITED STATES AND CANADA.

PERKINS & CO.

NEW YORK.

TRADE CPB MARK




DUNDEE
TAYPORT
FIRTH OF TAY
PLESIO. BOGHEAD COLLIERY.
LEVEN
GERMAN OCEAN OR NORTH SEA
BURNTISLAND
CHARLESTOWN
GRANGEMOUTH
BO'NESS
FIRTH OF FORTH
GRANTON
LEITH
EDINBURGH
SCALE OF MILES.
MILE 1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with A. E. Scott & Co.)

72 Broadway, New York City.

March 2.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Consolidated	$35,430,000	100	83½	85
Central	440,000	50	60	—
" Scrip	220,000	—	47	57
Equitable	2,000,000	100	95	97
" Bonds	1,000,000	—	102½	103½
Harlem, Bonds	170,000		—	—
Metropolitan, Bonds	658,000	—	110	112
Mutual	3,500,000	100	120	122
" Bonds	1,500,000	1000	104	106
Municipal, Bonds	750,000		107	110
Northern	125,000	50	—	80
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	129	131
Citizens	1,200,000	20	84	86
" S. F. Bonds	320,000	1000	106	110
Fulton Municipal	3,000,000	100	148	150
" Bonds	300,000		104	108
Peoples	1,000,000	10	80	82
" Bonds	290,000	—	105	110
" "	250,000	—	90	95
Metropolitan	1,000,000	100	96	—
Nassau	1,000,000	25	119	—
" Ctfs	700,000	1000	92	94
Williamsburgh	1,000,000	50	132	135
" Bonds	1,000,000	—	106	108
Richmond Co., S. I.	300,000	50	64	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	80	85
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	103	115
" " Bonds.	124,000	—	105	110
Chicago Gas Co., Ills	5,000,0000	25	128	132
Peoples G. L. & C. Co., Chicago, Ills			8	12
Cincinnati G. & C. Co.			180	182
Consolidated, Balt.	6,000,000	100	83	83½
" Bonds	3,600,000		110	111½
Central, S. F., Cal.			—	58
Capital, Sacramento, Cal.			56	—
Hartford, Conn	750,000	25	123	129
Jersey City	750,000	20	124	128
Laclede, St. Louis, Mo.	1,600,000	100	88	—
Louisville, Ky	1,500,000	50	95	100
Montreal, Canada	2,000,000	100	181	182½
New Haven, Conn		25	166	170
Oakland, Cal.			29	30
Peoples, Jersey City		—	45	50
" " Bonds			—	—
Paterson, N. J.		25	90	—
Rochester, N. Y.		50	75	80
Washington, D. C.	2,000,000	20	190	195
Wilmington, Del.		50	188	—
Yonkers		5	96	92
St. Louis, Missouri	600,000	50	—	—
San Francisco Gas Co. San Francisco, Cal.			58	59

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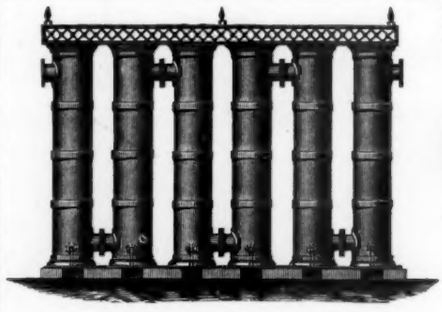

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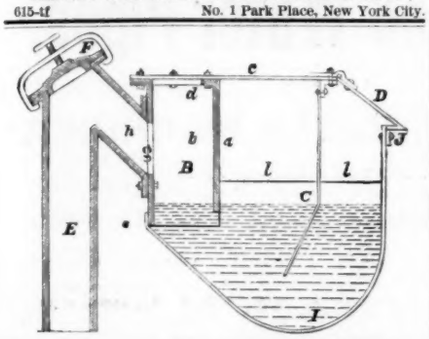

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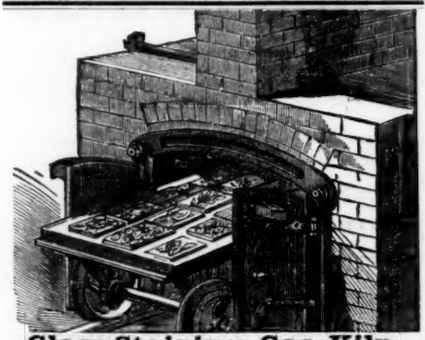

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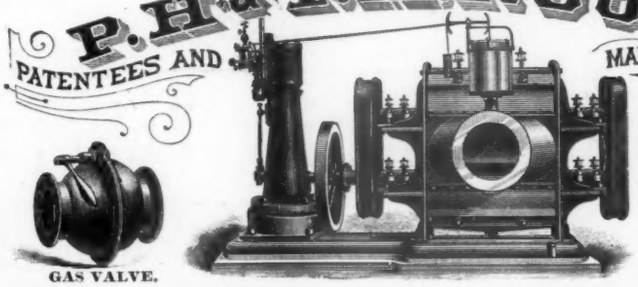

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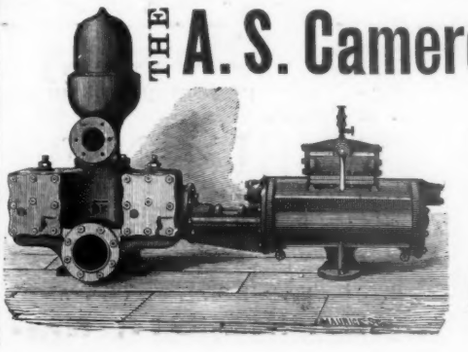

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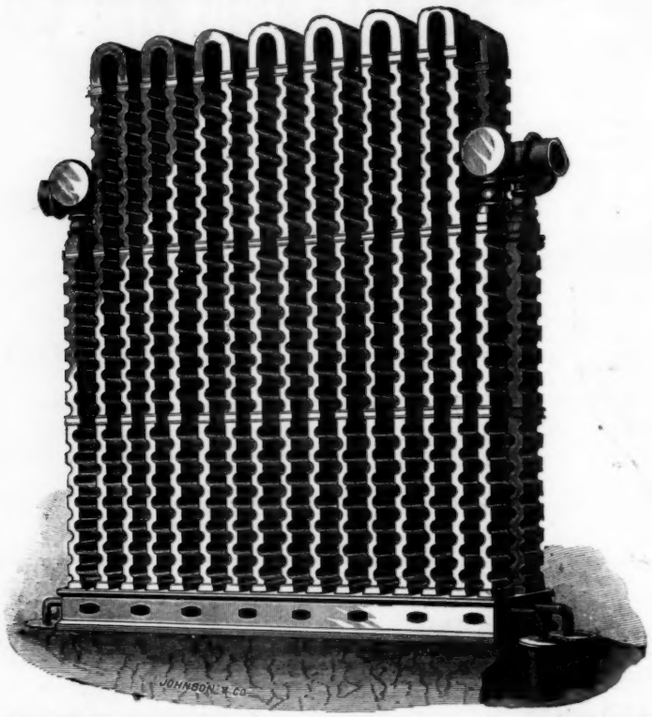

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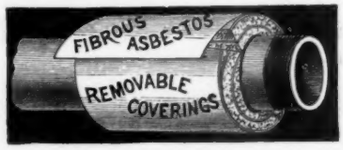

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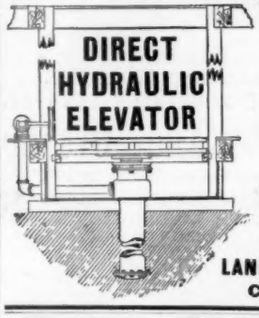

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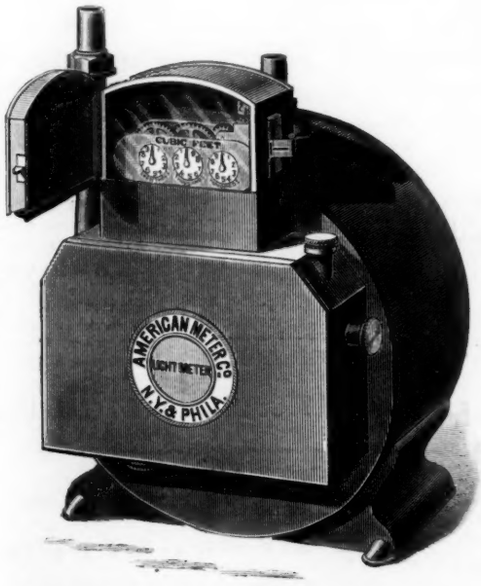

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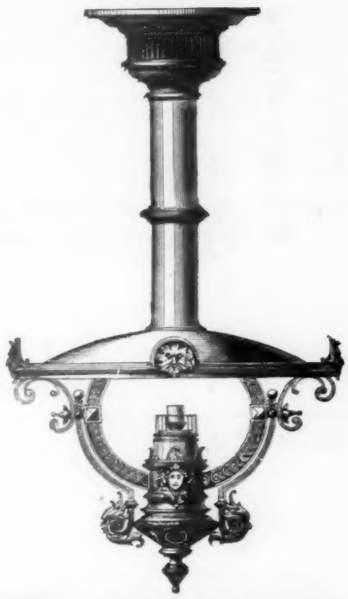

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1879	24,545,000 "
1880	42,967,500 "
1881	36,462,500 "
1882	39,300,000 "
1883	57,735,000 "
1884	26,177,500 "
Total	235,937,500 cubic feet.

Total Number and Capacity per 24 Hours of "Standard" Washers Erected and in Course of Erection in the Several Countries

	Number.	Cubic Feet per Day.
Great Britain	151	157,070,000
Western Hemisphere	38	39,337,500
Australia	18	12,150,000
New Zealand	2	650,000
France	6	4,550,000
Belgium	8	5,420,000
Germany	16	8,200,000
Holland	4	4,160,000
Denmark	1	150,000
Russia	2	3,500,000
Spain	1	350,000
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Total	248	235,937,500

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C. R. FABEN, Jr.,
Superintendent.

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	Cu. Ft. per Day
Anneberg Gas Co	200,000
Bombay Gas Co	400,000
Brussels Co	1,250,000
Chemnitz Gas Co	1,000,000
CITIZENS GAS CO., BUFFALO	750,000
Coke Works in Zabre, Ober-Schlesien	1,500,000
Cokerei der Friedenshutte, Upper Silesia	700,000
Dumfries Corporation	250,000
Dunedin Gas Co., New Zealand	400,000
King's Lynn Gas Co	300,000
Leiden, Holland	600,000
Lincoln Gas Co	400,000
Liverpool Gas Co	2,000,000
" "	3,000,000
LOUISVILLE GAS CO.	1,500,000
Numea Gas Co	100,000
PITTSBURGH GAS CO.	1,500,000
PORTLAND GAS CO., Oregon	562,500
SAN FRANCISCO GAS CO	4,000,000
Sheepbridge	40,000
ST. LOUIS GAS CO.	2,000,000
Sydney Gas Co	2,500,000
WASHINGTON, D. C. GAS CO	2,000,000
Whitchurch Gas Co	175,000
Total	26,177,500

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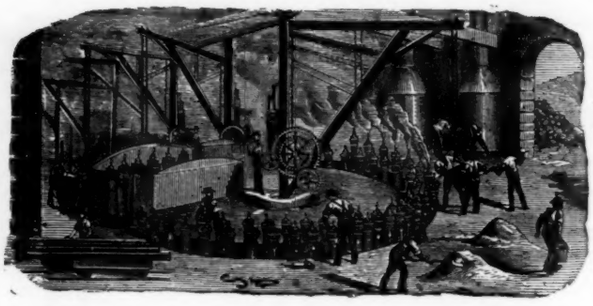

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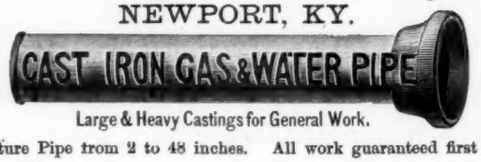

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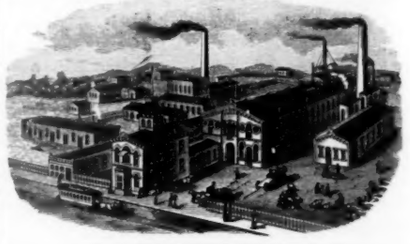

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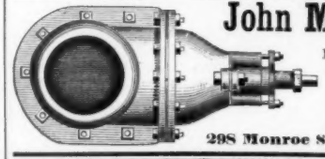

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Canton, "	"	60,000	"
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Ypsilanti, Mich	"	25,000	"
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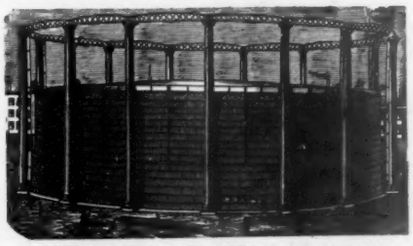

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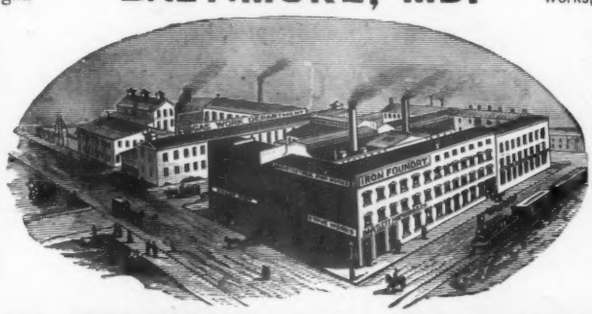

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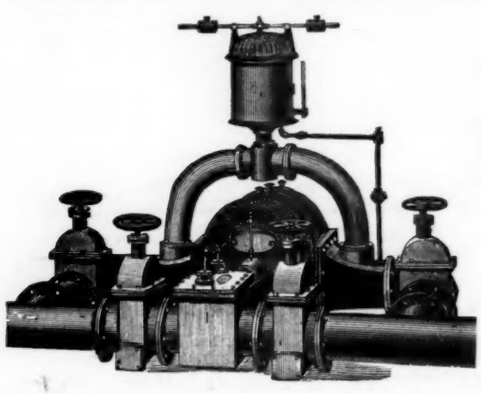

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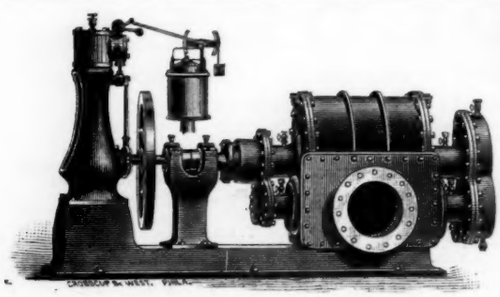

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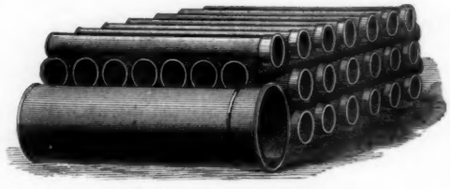

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"SUN DIAL" GAS STOVES

The Most Economical, Efficient, and Durable Gas Stove Made.

Since 1878, when we began to manufacture these Stoves, we have received 17 Gold, Silver, and Bronze Medals, and 6 Diplomas for Efficiency, Superiority of Workmanship, etc. etc.

ALL FITTINGS ARE NICKEL-PLATED WITHOUT EXTRA CHARGE.

THE OVEN BURNERS ARE CONSTRUCTED TO BURN EITHER PURE GAS OR GAS AND AIR MIXED.

FROM TWENTY-FIVE TO FORTY PER CENT. OF GAS SAVED BY THE USE OF OUR PATENT OVEN LINING.

STOVES THAT WILL COOK FOR ONE PERSON OR ONE THOUSAND PERSONS AT ONE TIME.

STOVES FOR LAUNDRIES, HATTERS, AND TAILORS.

HOT WATER GENERATORS FOR USE IN KITCHENS, BATH ROOMS, ETC., ETC.

BROILING RANGES FOR RESTAURANTS AND HOTELS.

OVER THIRTY-FIVE THOUSAND STOVES OF ALL SIZES SOLD SINCE 1878.

SEND FOR ILLUSTRATED CATALOGUE.

Gas Cooking Stove No. 9A. FITTED WITH OUR PATENT TOP AND OUTLET PIPE FOR CARRYING OFF COMPLETELY ALL THE PRODUCTS OF COMBUSTION FROM, OVEN, ROASTER, AND TOP BURNERS.

We carry in Stock Nos. 7, 8, and 8A Cooking Stoves fitted with our Patent Tops. See Catalogue and Price List.

We desire to call attention to our IMPROVEMENT IN THE TOP OF THE SUN DIAL GAS STOVE, by means of which all the odors and products of combustion from the ovens and top burners are entirely removed from the room. This is accomplished by channels and flues connected to the pipe shown at back of stove, to which is connected such additional pipe as may be necessary to connect the same with the flue or chimney, thereby producing the same effect in conveying away the products of combustion as is done in the use of the ordinary range, etc. This arrangement fills a want that has long been felt by those who have objected to the use of gas stoves for the reason of there being no adequate means to remove the products of combustion and odors from the roasting chambers, ovens, and boiling burners, all of which is now accomplished. *We have secured the improvement by Letters Patent in this country and Europe, and any attempt at infringement will be prosecuted.*

AGENTS FOR CLERK'S PATENT GAS ENGINE.